

2015-1971

**United States Court of Appeals
for the Federal Circuit**

SECURE AXCESS, LLC

Plaintiff – Appellant,

v.

NINTENDO OF AMERICA, INC.,

Defendant – Appellee.

*Appeal from the United States District Court from
the Western District of Washington in Case No.2:14-cv-01013,
Judge Ricardo S. Martinez.*

OPENING BRIEF OF PLAINTIFF – APPELLANT

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December 2, 2015

CERTIFICATE OF INTEREST

Counsel for Appellant Secure Axxess LLC certifies the following:

1. The full name of every party or amicus represented by me is:

Secure Axxess LLC.
2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by me is:

Secure Axxess LLC.
3. The parent companies, subsidiaries (except wholly-owned subsidiaries), and affiliates that have issued shares to the public, of the party or amicus represented by me are:

Secure Axxess, LLC is a wholly-owned subsidiary of Prism Technologies, Inc., which is a wholly-owned subsidiary of the publicly-traded company Prism Technologies Group, Inc.

4. The name of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court are:

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Dated: December 2, 2015.

Respectfully submitted,

/s/ Philip P. Mann
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I. STATEMENT OF RELATED CASES

There are no other cases known to counsel pending in this or any other court that will directly affect or be directly affected by this Court's decision in the pending appeal.

This matter was initially filed by Secure Axxess, LLC in the Eastern District of Texas as Civil Case No. 2:13-cv-00032-JRG against Nintendo Co. Ltd. and a number of other defendants. A34. Secure Axxess' claims against Nintendo were severed from Eastern District of Texas (A46, Dkt. 167) and transferred to the Western District of Washington as Civil Case No. 2:14-cv-01013-RSM. The case in the Eastern District of Texas is stayed pending the outcome of the litigation in the Western District of Washington.

II. APPELLATE JURISDICTIONAL STATEMENT

(a) Jurisdiction in the District Court was based upon 28 U.S.C. § 1331 and 28 U.S.C. § 1338 this being a civil action arising under an Act of Congress relating to patents.

(b) This Court's jurisdiction is based on 28 U.S.C. § 1295(a)(1), this being an appeal from a final decision of a District Court in a civil action arising under an Act of Congress relating to patents.

(c) This appeal is timely under Fed. R. App. P. 4. Final judgment was entered by the District Court on August 4, 2015. A Notice of Appeal to this Court was timely filed on August 18, 2015.

III. STATEMENT OF THE ISSUES

Did the District Court err in construing the following claim terms of United States Patent No. 6,522,309?

1. “Translative Video Adapter” (Claims 1, 9, 13).
2. “TVA Input Port” (Claims 1 and 2)
3. “Video Output Port/Video Data Signal Output Port” (Claims 9 and 13)
4. “Ported Source” (Claim 1)
5. “First converting the first read said first video data signal into a first predecessory video signal”/first converting the first read said first stored data into a supplementary display video signal” (Claims 1 and 9).
6. “TVA Means” (Claim 13)
7. “First Conversional Means” (Claim 13)

More specifically, did the District Court err in holding that (1) the TVA must be a “detachable” device; (2) the TVA does not implement “bi-directional” communication; and (3) the TVA only supports conversion of “analog” video signals when construing the '309 patent claims.

IV. STATEMENT OF THE CASE

The late Mr. Harold Weber is the sole named inventor in U.S. Patent No. 6,522,309 (“the '309 Patent”) entitled “Multiscreen Personal Computer Display Method and Apparatus.” As set out in the '309 Patent, Mr. Weber invented a method for driving two or more displays from one computer that operates separately from the video processing components of a main computer. His patented method utilizes an inventor-named “translative video adapter” (“TVA”) system to acquire processed graphics data from a main computer, temporarily store the data, and then split the data into multiple feeds for re-display. Mr. Weber disclosed an array of preferred embodiments within the '309 patent to illustrate this method, and the role of the TVA within it.

The proceedings below centered largely on what is meant by “TVA” in the context of the '309 patent claims. At its core, the dispute turns upon whether or not Mr. Weber intended the TVA to be limited to a “detachable,” “removable” device that only communicates “unidirectionally” and only converts “analog” signals from a computer.

In the proceedings below, the District Court ignored Mr. Weber's clear statements (made in the '309 patent itself) and held that the TVA must be a “removable hardware accessory device.” A12. In reaching this conclusion, the District Court made two fundamental errors: First, the District Court ignored the numerous embodiments described within the patent. Second, the District Court improperly inserted limitations from preferred embodiments into the claim language. These errors directly contravene well established principles of patent law and should be reversed.

V. STATEMENT OF THE RELEVANT FACTS

This is an action for infringement of U.S. Patent No. 6,522,309 (“the ‘309 Patent”), entitled “Multiscreen Personal Computer Display Method And Apparatus,” issued on February 13, 2003. The action was brought by Secure Axxess, LLC against Nintendo Corporation.

A. Summary of the '309 Patent

Harold J. Weber (“Mr. Weber”) is a named inventor on more than 80 patents, many of which he prosecuted himself. Mr. Weber filed the application for the '309 Patent on February 28, 2000 and prosecuted to it its issuance on February 18, 2003. A48. Mr. Weber later assigned the patent to himself as the trustee For SavvyStuff Property Trust on May 29, 2010. By written assignment dated April 16, 2012 the trust assigned the patent to Plaintiff-Appellant Secure Axxess, LLC, with Mr. Weber's estate retaining an interest. A85 ¶¶21-24.

B. Background of the Invention

1. Before Mr. Weber's Invention

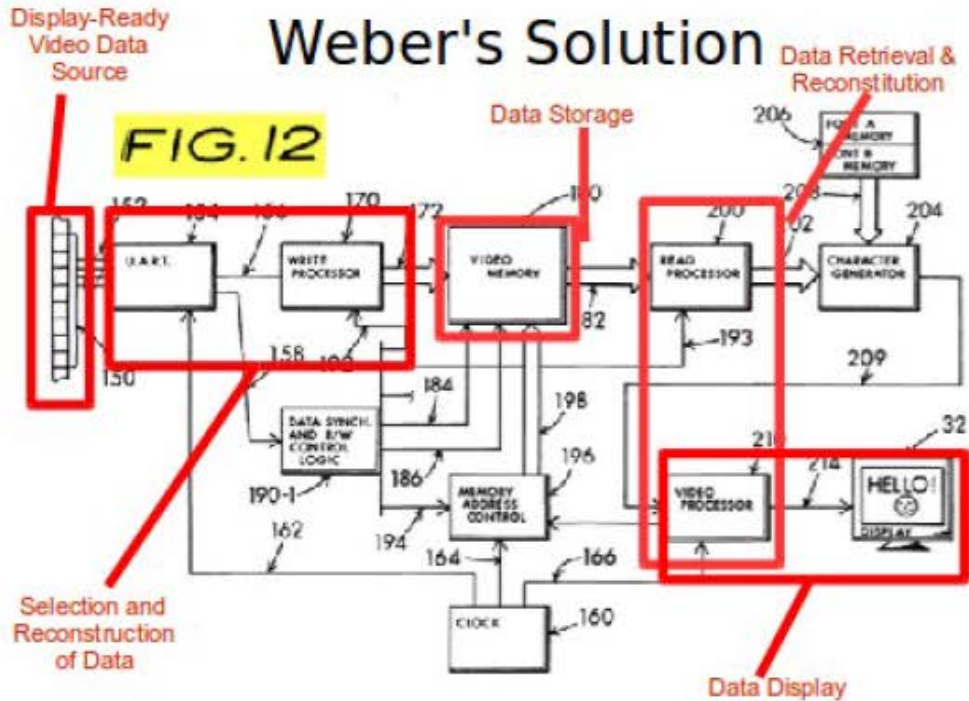
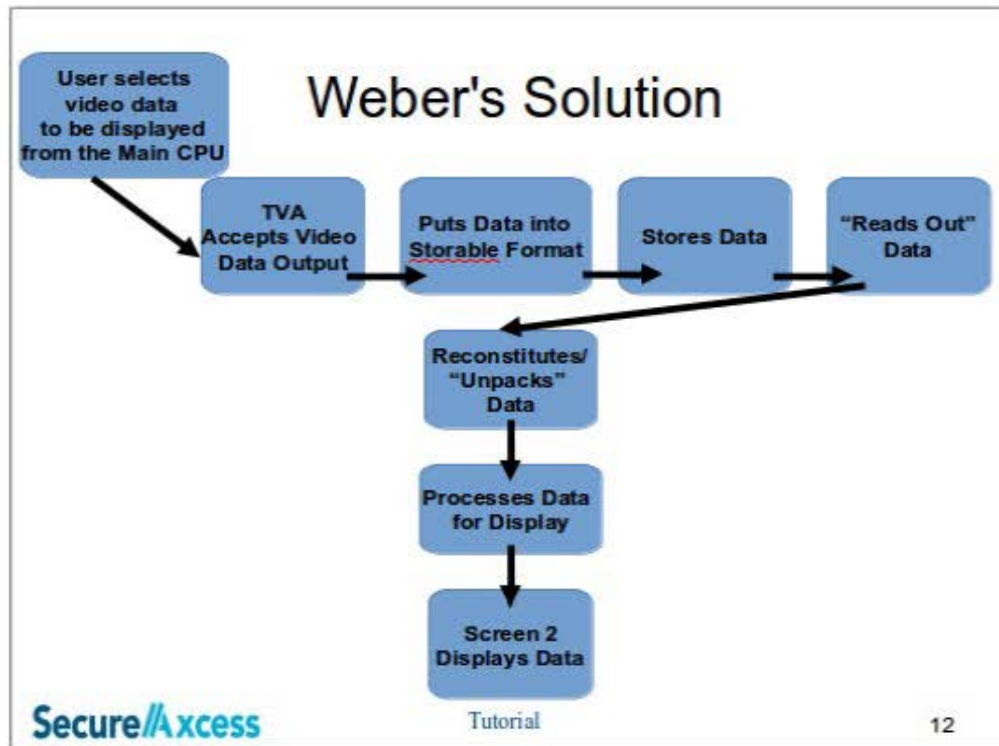
When Mr. Weber applied for the '309 Patent, dual computer monitor systems were rare. In the 1990's and earlier, dual display systems were difficult to implement and posed many technical

obstacles, including (a) the requisite use of more than one (then-expensive) graphics adapter cards, (b) incompatibility of graphics adapter cards, (c) difficulty of implementing appropriate software, and (d) navigating other complicated system configurations. A64, Col.3:31-4:32. Available systems either lacked software support for multiple monitors and/or required multiple graphics adapter (or video) cards. In other words, each graphics display feed was separately connected to a CPU bus on the motherboard. For example, when Microsoft released Windows 98 in June 1998, this new operating system claimed to support multiple monitors from a single PC; however, this functionality again required a separate graphics adapter between the CPU bus and each separate monitor. The bandwidth limitations of buses in this era also severely restricted overall graphics performance, making all prior art configurations less than commercially acceptable.

2. Mr. Weber's Claimed Invention and TVA

To overcome these shortcomings and others, Mr. Weber invented a method to utilize his TVA device to accept a video output from the main CPU into multiple video displays. His invention utilizes the “legwork”

already performed by the main CPU, thereby eliminating the issues of installing separate graphics processors for each display and navigating software compatibility. The two images recreated on the next page were shown by Secure Axxess during the claim construction hearing to explain the core steps of Mr. Weber's invention, and are recreated faithfully for illustrative purposes only:



As shown above, and claimed, in the '309 Patent, Mr. Weber's method includes the use of an arrangement of components to select data to be sent to his TVA device. As shown above, the TVA device itself is an arrangement of components which may be “engineered in variant forms” (A65, Col.6:18:23), for the physical components and arrangement only matter insofar as they are “functionally distinct from the data processing and video signal processing activities of the computer...” A78, Claim 13, Col. 27:66-28:1.

C. The Disputed Claim Terms

In the proceedings below, both Parties submitted a number of claim terms for construction by the District Court. Both parties agreed that the term “Translative Video Adapter” (“TVA”) should be construed. A8.

In addition to “TVA,” Secure Axxess proposed the following terms for construction: (1) “first operative means,” (2) “first conversional means,” (3) “first memory means,” (4) “first retrieval means,” (5) “second conversional means,” (6) “port,” and (7) “ported source.” A8.

In addition to TVA, Nintendo proposed the following terms for construction: (8) “predecessory display/supplementary video data/predecessory video data display,” (9) “first sample of the first screen data/first sample of a first screen portion,” (10) “TVA input port,” (11) “video output port/video data signal output port,” (12) “usually,” (13) “first converting the first read said first video data signal into a first predecessor video signal/first converting the first read said first stored data into a supplementary display video signal,” (14) “display-ready first processed video data signal/processed video data signal/display-ready video signal,” and (15) “intercoupling/intercoupled/coupled.”

Nintendo also asserted (and the District Court agreed) that, pursuant to 35 U.S.C. § 112 ¶ 6, all of the following “means-plus-function terms” in Claim 13 must at some point be construed by the Court: (1) “first operative means,” (2) “first retrieval means,” (3) “second conversional means,” (4) “first conversional means,” (5) “first memory means,” and (6) “translative video adapter (TVA) means.” A8.

Ultimately, the District Court declined to construe the following terms: “display-ready first processed video data signal/processed video

data signal/display ready video signal,”
“intercoupling/intercoupled/coupled,” and “predecessory video
signal/supplementary display video signal.” A28-29.

Of the constructions adopted by the District Court, Secure Access
seeks review by this Court of the following:

1. Translative Video Adapter (Claims 1, 9, 13).
2. TVA Input Port (Claims 1 and 2)
3. Video Output Port/Video Data Signal Output Port (Claims 9
and 13)
4. Ported Source (Claim 1)
5. First converting the first read said first video data signal into
a first predecessory video signal/first converting the first
read said first stored data into a supplementary display
video signal (Claims 1 and 9).
6. TVA Means (Claim 13)
7. First Conversional Means (Claim 13)

A8.

The constructions of the above seven terms all resulted from the
District Court's incorrect holdings that: (1) The TVA must be a
detachable device; (2) the TVA is incapable of bi-directional

communication; and (3) the TVA only supports conversion of analog video signals.

D. The Court's Order and Final Judgment

On March 20, 2015, the Court held a claim construction hearing. A32, Dkt. 27. On June 30, 2015, in order to encourage action from the Court, the Parties jointly moved to modify the case schedule and informed the Court that its order on claim construction would likely be case-dispositive at the district court level. A32, Dkt. 30. Two days after granting the stipulated modifications (A32, Dkt. 31), the District Court, adopted every single argument and claim construction put forth by Nintendo without any alteration whatsoever. It issued this word-for-word adoption in its Claim Construction Order on July 9, 2015. A4. Recognizing that Nintendo made its claim construction arguments to avoid infringement, the Parties jointly moved for entry of final judgment in order to permit an appeal to this Court. A32, Dkt. 34. Final judgment was entered on August 4, 2015 (A32, Dkt.36) and Secure Axxess' Notice of Appeal was filed August 18, 2015.

VI. SUMMARY OF THE ARGUMENT

The District Court rendered its erroneous claim constructions because it misunderstood the invention and consequently misapplied well-settled patent law. In particular, the District Court ignored the numerous embodiments described within the '309 Patent and reflected an apparent misunderstanding of how computer software actually works. The District Court improperly imported limitations from the *preferred* embodiments into the claim language and found limitations in the claims that (a) do not appear in the actual claim language and (b) are not compelled by other statements in the '309 Patent or its file history. Instead of ascertaining what Mr. Weber actually invented in the '309 Patent, the District Court simply adopted Nintendo's arguments and constructions without *any* alteration whatsoever.

Mr. Weber's TVA functions by receiving, from a computer, “display-ready video data” that would otherwise go directly to a computer's monitor. The TVA intercepts this data, converts it, stores it briefly, “unpacks” the data, and re-displays the data onto multiple displays. A64, Col. 4:42-51; A66, Col.9: 55-64. The core essence of Mr.

Weber's invention is that all of these steps are performed in such a way that is *functionally distinct* from the main data processing and video signal processing elements of the main computer. A76; Claim 13, Col. 27:66-28:1. To depict variant forms to effectuate this method, Mr. Weber depicted multiple *physical* arrangements of the TVA to ensure that it would indeed operate distinctly from the rest of the computer. However, the District Court incorrectly ruled that the TVA must be *physically* distinct in order for it to be *functionally* distinct. Using this apparent misunderstanding, and others, the District Court misconstrued multiple claim terms of the '309 Patent.

VII. ARGUMENT

A. Governing Law

1. Standard of Review

Where, as here, the Court reviews only evidence intrinsic to the patent (the patent claims, specification, and prosecution history), the District Court's determination is reviewed *de novo*. *Teva Pharma. USA, Inc. v. Sandoz, Inc.*, 574 U.S. ____ (2015); *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996); *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998)(en banc).

2. Plain and Ordinary Meaning Is Default

"We generally give words of a claim their ordinary meaning in the context of the claim and the whole patent document; the specification particularly, but also the prosecution history, informs the determination of claim meaning in context, including by resolving ambiguities; and even if the meaning is plain on the face of the claim language, the patentee can, by acting with sufficient clarity, disclaim such a plain meaning or prescribe a special definition." *In re Papst Licensing Digital Camera Patent Litigation*, 778 F.3d 1255, 1261 (Fed. Cir. 2015) citing

World Class Tech. Corp. v. Ormco Corp., 769 F.3d 1120, 1123 (Fed. Cir. 2014).

3. Broad Constructions Are The Norm

Where a claim construction is broad enough to encompass two different embodiments, that is normally the proper construction. *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276 (Fed. Cir. 2008)(“We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification.”). Indeed, unless the specification or prosecution history clearly disavows an embodiment, it is ***reversible error*** to construe that embodiment out of the claim. *Oatey*, 514 F.3d at 1277 (improper to construe claim to exclude embodiments absent clear disclaimer)(numerous citations omitted).

While claims should be interpreted in light of the specification, it is impermissible to “import limitations into claims from examples or embodiments appearing only in a patent’s written description, even when a specification describes very specific embodiments of the invention or even describes only a single embodiment, unless the specification makes clear that ‘the patentee ... intends for the claims

and the embodiments in the specification to be strictly coextensive.”
Oatey, 514 F.3d at 1277; *JVW Enters., Inc. v. Interact Accessories*, 424 F.3d 1324, 1335 (Fed. Cir. 2005) (quotations omitted).

B. The TVA is Not Limited as a Separate, Detachable Device

It is axiomatic in claim construction that in order to overcome the “heavy presumption” of plain and ordinary meaning, an accused infringer cannot simply “[point] to the preferred embodiment or other structures or steps disclosed in the specification or prosecution history” in order to limit what is claimed. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)(quoting *Johnson Worldwide Assoc., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 (Fed. Cir. 1999)). Ignoring intrinsic evidence to the contrary, the District Court improperly held that the TVA is limited as a “separate,” “detachable” device that must be physically “distinct from the computer.” A12-14. This apparent fundamental misunderstanding of what is covered by Claims 1, 9, and 13 of the '309 Patent misinformed the District Court's adoption of the following constructions put forth by Nintendo:

- “Translative Video Adapter” (Claims 1, 9, and 13) “accessory

device ***added to an existing computer system*** that provides a non- interactive link of the processed video signal from the video output port to a passive display monitor.” A17. (emphasis added).

- “TVA means” (Claim 13) “Using an accessory device ***added to an existing computer system*** to provide a non-interactive link of the processed video signal from the video output port to a passive display monitor.” A25-28 (emphasis added).
- “TVA Input Port” (Claims 1 and 2) “an input terminal or connection point in the TVA that allows for a device to be ***detachably connected*** to the TVA.” A17. (emphasis added).
- “video output port”/“video data signal output port” (Claims 9 and 13) “an output terminal or connection point adapted to be ***detachably connected*** to a monitor.” A23. (emphasis added).
- “Ported Source” (Claim 1) as “video output port of a video adapter or graphics accelerator card.” A24.

The words, “added to an existing computer system” and “detachably connected” appear nowhere in the patent claims. Importantly, nothing in the specification suggests (1) that the TVA must be added to an existing computer system; (2) that the TVA must be a separate device; or (3) that the TVA is limited to sampling video data from a video adaptor or graphics accelerator card. Plainly, the District Court misinterpreted the difference between *functionally* distinct versus

physically distinct aspects of the invention. Accordingly, this Court should adopt Secure Axxess' proposed constructions as set forth below:

- “Translative Video Adapter” (Claims 1, 9, and 13): “software and/or hardware configured to accept video data for display on a primary video display device, prepare and store the video data in memory, retrieve the stored video data from memory, and prepare and transmit the stored video data for display on a secondary video display device.” A430-431.
- “TVA means” (Claim 13): “Accepts video data from a source and provides the video data to one or more displays in response to a bidirectional protocol.” A440.
- “TVA Input Port” (Claims 1 and 2): “any internal or external data channel through which data enters or exits.” A437, A589
- “video output port”/“video data signal output port” (Claims 9 and 13): “any internal or external data channel through which data enters or exits.” A437, A589-590
- “Ported Source” (Claim 1): “any internal or external data channel from which data may be obtained.” A435-436.

Rather than parse out each “port” term and read in limitations from the preferred embodiments, Secure Axxess proposed the more proper, uniform construction for the term “port.” A435-437. Thus, the District Court should have adopted Secure Axxess' proposals because each proposal above encapsulates Mr. Weber's invention, and does not import artificial limitations into the claims. *See, Papst*, 778 F.3d at 1263

(reversing district court's determination that the phrases “interface device” and “...attached to the second connecting device...” required the claimed invention to be a standalone device).

This Court's decision in *Papst* is instructive here, for it involved an invention that also operated functionally distinct from a main process. *Papst* 778 F.3d at 1263. Similar to the invention discussed in *Papst*, neither the claims nor the specification of the '309 Patent require the TVA to be a separate, detachable device. The District Court's conclusion to the contrary is wrong as a matter of law and should be reversed.

1. Weber Discusses Multiple Embodiments to Effectuate The Functions of the TVA

Contrary to the District Court's unsupported finding that the '309 Patent discloses only two embodiments (A6), the '309 Patent actually discloses more than two embodiments. See, '309 Patent, Figs. 1,2,3,5,6,7,9,11,12,13,16, and 17. Furthermore, the District Court's reliance on *Eaton Corp. v. Rockwell Intern. Corp.*, 323 F.3d 1332, 1339-41 (Fed. Cir. 2003) was also misplaced. A16. In *Eaton* this Court held that the *preamble* of a patent claim can limit what is otherwise stated in

the body of a patent claim. Contrary to the District Court's belief, this Court did *not* hold in *Eaton* that preferred embodiments described in a patent specification can, without more, automatically limit what is claimed. Thus, even if the '309 Patent showed and described but two embodiments, the District Court improperly used them to limit the clear language of the patent claims. *See, Oatey* 514 F.3d at 1276. Again, it is elementary patent law that limitations from the preferred embodiment are not to be read into the claims absent a clear indication elsewhere to do so. Such a clear indication is not present here.

One core function of the TVA is to first obtain “display-ready video data” from any source in a computer system. All that is required is that the TVA *operates* separately from the main video processing functions computer, not that the TVA is *physically* separate (i.e, is contained in a separate box or utilizes a separate connector) from the main computer. A76, Col. 27:66-28:1; Claim 13. As described by Mr. Weber, this can be accomplished by sampling data from a computer's serial printer port (A58, Fig. 12; A66, Col. 8:11-15; A72, Col:19:26-37), or a computer's databus (A66, Col.7:7-32), or any other network port (A65, Col.5:30-36).

Nowhere does Mr. Weber indicate that his invention requires a separate, standalone unit that is physically distinct and separate from the computer.

Thus, when the District Court construed “**Ported Source**” (Claim 1) to be limited as a “video output port of a video adapter or graphics accelerator card.” (A24), it flatly ignored the above sources of display-ready video data. Indeed, Figure 12, Col.8-11-15, and Col. 19:51-58 of '309 Patent plainly shows the TVA device receiving the requisite video data samples from a printer port. Additionally, the TVA “taps into and accepts a sample of display-ready processed video” (A66, Col. 7:7-32) directly from the computer.

Similarly, when the District Court construed “TVA Input Port” (Claims 1 and 2) as “an input terminal or connection point in the TVA that allows for a device to be *detachably* connected to the TVA.” A17. (emphasis added), it inserted limitations simply not found in the specification of the '309 Patent. The District Court forced the same limitations from preferred embodiments when it construed “video output port”/“video data signal output port” (claims 9 and 13) as “an

output terminal or connection point adapted to be ***detachably connected*** to a monitor.” A23 (emphasis added). Simply put, detachability or separability has zero bearing on the inventive nature or function of Mr. Weber's invention. The District Court's holdings are therefore wrong as a matter of law. *Papst* 778 F.3d at 1263-64 (holding that the separable nature of preferred embodiments was not an “essential part of the invention” and was therefore improperly read into the claims).

2. The District Court Misunderstood the Fundamental Nature of the TSR Software

The functions of the TVA can be implemented manually with a separate physical “switch,” or with the assistance of a so-called “Transient Stay Resident” (“TSR”) software program:

A primary display video screen selection is made by actuation of an auxiliary key-switch associated with the adapter, by a "third" mouse button entry or by a unique keyboard sequence entry processed by a TSR program to enable the necessary function.

A63, Col.1:37-41.

It is the purpose of the TSR program to recognize and translate keystroke sequences into FSC (frame selective

control) signals which may be output through the computer's serial port on line 19 and couple with the TVA 50.

Col. 16:47-50; See also, Col. 7:52-63; Col. 10:59-64; Col. 14:17-19.

Thus, when a physical switch is not used, the TSR program is necessary to initiate the “frame-grabbing” or “frame selection” step in Mr. Weber's patented method. The fact that the TSR program is installable in the main CPU's high-memory (A67, Col.10:37-43) is immaterial, because all of the steps of the invention *operate* distinctly from the main video processing functions of the computer. Col. 14:63-15-1 (... “the TVA is functionally distinct from the computer ...”); Col. 27:66-28:1; Claim 13.

The District Court improperly dismantled a straw-man argument arranged by Nintendo during its discussion of the TSR software-implemented embodiment of the TVA. A6-7; A13-14; A26-27. Specifically, the District Court improperly found that the TSR program is not a part of the TVA. A13-14. As explained in Appellant's Response Brief filed in connection with the claim construction proceedings, the patented invention can be implemented with or without a TSR program, but never *solely* as a TSR program. A585, A592. When the TVA is

implemented with a TSR program, the TVA, like all computer software, necessarily requires hardware to carry out its functions. What is most troubling is that this approach to interfacing with the TVA is claimed unambiguously in Claim 9: “...comprising steps of: operating a computer under software control to produce a first screen data signal...” A75, Claim 9.

However, the District Court apparently did not understand this fundamental aspect of software, and apparently did not understand that a TSR-implemented TVA *functions* exactly as claimed in claims 1, 9, and 13 of the '309 Patent. As discussed, *infra*, the TVA is defined in terms of how it functions. A67, Col. 9:55-64. In order for the TVA to convert, store, and redisplay the user-selected data sample, the user must first interact with the TSR program. A63, Col.1:37-41. Furthermore, electrical components comprising a computer do not function in a vacuum without *some* form programming to implement such functions. This is yet another example of the District Court's apparent fundamental misunderstanding of the basic relationship between hardware and software.

3. The '309 Patent Is Not Limited to The Disclosed Embodiments

A patent applicant cannot claim abstract ideas. As a result, an applicant must disclose embodiments in order to effectuate a patented method, but he is not limited to those embodiments. Indeed, as Claim 13 contains multiple “means plus function” steps, structures which are “equivalents thereof” to the cited structures are necessarily considered by the breadth of the claim under 35 U.S.C. § 112 ¶ 6. Mr. Weber clearly stated he had no intention to limit his claims to the embodiments used to describe his invention. A69, Col. 13:27-36; Col. 24:3-53. In particular, Mr. Weber also stated as follows:

A skilled artisan will readily understand that my invention is not narrowly limited to the particular kinds of data sources or display types which I discuss, but the produced operational improvements and user convenience afforded by my invention may be more broadly extended to benefit virtually any type of computer display configuration requiring supplementary displays of previous screens of data on a secondary monitor.”

Col. 24:32-39.

As an invention based upon method claims, this invention can be effectuated with an adjunct device, or with a permanently soldered

component added to an “existing computer system.” Accordingly, the District Court's importation of Nintendo's limitations of “accessory device added to an existing computer system” within its proposed construction should be disregarded as it pertains to its construction of “TVA” and “TVA means.”

4. Secure Axxess' Proposals Do Not Separate The TVA

To avoid complication, and improper limitations, from particular embodiments, Secure Axxess proposed one construction for “port” to be used with all of the so-called “port terms” as follows: “any internal or external data channel through which data enters or exits.” As noted in Secure Axxess' opening brief in the claim construction proceedings, this definition encapsulates all uses of the term “port” and comports with industry norms. A437 – A439. Further, like all of the other so-called “port terms,” Secure Axxess' construction of “ported source” as “any internal or external channel from which data may be obtained” encapsulates *all* sources of display-ready video data that the TVA receives.

Additionally, Mr. Weber “act[ed] as his own lexicographer” when he expressly defined the TVA in terms of its function:

I have coined the term Translative Video Adapter (TVA) to succinctly phrase it's [sic] technical performance. In effect, my TVA accepts the processed video signal from the computer, firstly translates the video signal into a binary format for digital memory storage.¹ The digital memory is subsequently read-out and the retrieved binary format data is then secondly translated back into a reconstructed processed video signal format that serves to drive the secondary, or antecedent display monitor and closely replicate the predecessory screen of data.”

A67, Col. 9:55-64. Secure Axxess' proposals for “TVA” (A430) and “TVA means” (A440), which follow Mr. Weber's definition, are far more appropriate than the District Court's importation of preferred embodiments. *Bell Atlantic Network Svcs. v. Covad*, 262 F.3d 1258, 1268 (Fed. Cir. 2001) (“the specification acts as a dictionary when it expressly defines terms used in the claims...”)(citations omitted). As such, the District Court's wholesale, unflinching adoption of Nintendo's incorrect proposals should be reversed.

¹ This refers to an analog embodiment. Additional, pure digital embodiments which do not require analog-to-digital conversion are discussed *infra*.

C. The TVA Discloses Bi-Directional Data Communication

The District Court erred when it held that the TVA only provides a “non-interactive” link between the computer and a “passive display.” A14, A17. This erroneous holding tainted its constructions of the following terms:

- “Translative Video Adapter” (Claims 1, 9, and 13) as “accessory device added to an existing computer system that provides ***a non- interactive link*** of the processed video signal from the video output port to a passive display monitor.” A17 (emphasis added).
- “TVA means” (Claim 13) as “using an accessory device added to an existing computer system to provide ***a non- interactive link*** of the processed video signal from the video output port to a passive display monitor.” A25-A26.

1. The Specification Shows Bi-Directional Communication

In order to effectuate the TVA's performance, the TVA must be in ***interactive*** communication with the computer and corresponding secondary display monitor – not via a *one-way* communication. As Mr. Weber instructs while referring to Fig. 12, “Other control signals develop on a ***bi-directional*** data line 158 which flows between the UART and the data synchronization and R/W control logic 190-1 to

maintain the necessary synchronization of data flow and system ***handshaking***.” A72, Col.19:51-55 (emphasis added). Additionally, Figure 12 shows the video processor 210 providing a feedback signal to a memory address control 194. A12.

In an alternate embodiment of the TVA that connects to a computer's parallel printer port (Fig. 13), Mr. Weber shows a “negative going STROBE signal” in order to “signal the TVA that the data line states are valid and stable and therefore writable into memory.” A72, Col. 20:61-64. Additionally, the '309 Patent describes an ACKN (“acknowledgement”) signal 244 being sent from the write controller 240 back to the computer. Col. 20:66-21:5. Thus, as the specification shows, multiple components throughout the TVA circuitry must be in constant *two way* communication. This was ignored by the District Court below when it held that that the '309 Patent only mentions bi-directional communication in one place. A14.

2. The District Court Misunderstood the Obata Reference

In order to support its contention that Mr. Weber disclaimed “bidirectional communication,” the District Court adopted Nintendo's characterization of Mr. Weber's statements in the prosecution history distinguishing the Obata et al '669 reference. *See*, '309 File History, Response to Office Action dated July 8, 2002 at A289-292. Contrary to the District Court's finding (A14-15), Mr. Weber did not disclaim bi-directional communication by the TVA device (as noted above, Mr. Weber clearly teaches by the USB and network embodiments disclosed in the specification), but merely distinguishes Mr. Weber's *single-user, multi-display system* from Obata's *multi-user, single-display* telewriting networking communication system.

As Mr. Weber discussed in his Response to the Office Action, Obata taught a “method of managing multi-window communications between two image telewriting terminals.” A288. In particular, Obata taught a method of sharing a *single* document among *multiple* user terminals. A289-290. Mr. Weber disclaimed network-style screen-to-

screen, or terminal-to-terminal communication as was taught by Obata. He did *not* disclaim interactive communication among a screen, the TVA, and main computer, because his invention would be inoperable if “handshaking” and “ANKN” signals could not be exchanged freely among the component parts. Therefore, the District Court grossly erred when it rubber-stamped Nintendo's constructions.

3. Secure Axxess' Constructions Acknowledge Two-Way Communication

Plaintiff-Appellant's proposed constructions capture the significance of the above-referenced prosecution statement by clarifying that the TVA “retrieve[s] the stored video data from memory, and prepare[s] and transmit[s] the stored video data for display on a second monitor.” A430. As explained above and in Appellant's opening brief in the claim construction proceedings (A433-434), TVA must be in bi-directional communication with the computer and with the display monitors order for it to function. In particular, the “handshaking” and “ACKN” signals “maintain the necessary synchronization of data.” A72, Col.19:51-55. Because the components that perform Mr. Weber's

patented method ***must*** be in two-way communication in order for it to function, Secure Axxess' proposed constructions for “TVA,” (A430) and “TVA means” (A440) should be adopted by this Court as a matter of law.

D. The TVA Supports Digital-to-Digital Conversion

The District Court found that the '309 patent *only* discloses analog-to-digital (“A/D”) and digital-to-analog (“D/A”) conversion. A25. Accordingly, the District Court read the limitation “analog” into the claims its construction of the following terms:

- “First converting the first read said first video data signal into a first predecessory video signal/first converting the first read said first stored data into a supplementary display video signal” as “reconstructing the stored digital video data signal into an ***analog*** first predecessory video signal.” (Claims 1 and 9) A24-25 (emphasis added)
- “First Conversional Means” (Claim 13) to include the function described in the above “conversion” term. A28.

The “conversion” step of the TVA has nothing to do with converting a signal from analog to digital, or *vice versa*. Again, Mr. Weber made this abundantly clear in the specification:

“Realize that this analog to digital conversion and data storage scheme is presented as purely representative and that a knowledgeable engineer might substantially alter the technical detail, while still adhering to the spirit of my

invention.”

A121, Col.18:58-62. Rather, the first conversion step of the TVA is necessary in order to convert the display-ready video data into a storeable format. The second conversion step is necessary to “unpack” or “read out” the stored information into a format that can be redisplayed to the second display.

Mr. Weber disclosed embodiments that do not require A/D and D/A conversion. For instance:

A similar external adaptor may also be readily designed to couple with the TTL signal level video monitor output lines provided on many earlier personal computers. Since the usual video signals are inherently binary in these earlier display monitors, ***they do not require AD conversion*** but rather can obviously be engineered to couple directly with the memory. The output of the memory is then read-out and further conditioned back to a TTL level appropriate for application to the secondary TTL level video display monitor.

A68. Col.11:33-42 (emphasis added). Therefore, whether display-ready video data is digital or analog is immaterial. The District Court accordingly erred when it read the limitations of “analog” into its construction of “First converting the first read said first video data signal into a first predecessory video signal/first converting the first

read said first stored data into a supplementary display video signal” as “reconstructing the stored digital video data signal into an analog first predecessor video signal.” A25.

Because Secure Axxess' proposed constructions on the “first converting ...” and the “first conversional means” terms do not import the limitations of “analog” from preferred embodiments, and indeed encapsulate *all* of the preferred embodiments, they should be adopted by this Court as a matter of law. *Papst*, 778 F.3d at 1270-1271 (“we do not generally construe the claims of a patent to exclude a preferred embodiment.”) citing *Adams Respiratory Therapeutics, Inc. v. Perrigo Co.*, 616 F.3d 1283, 1290 (Fed. Cir. 2010) (“A claim construction that excludes the preferred embodiment 'is rarely, if ever, correct and would require highly persuasive evidentiary support.'”).

VIII. CONCLUSION

The District Court imported limitations from the preferred embodiments, ignored other embodiments, and misunderstood the invention. Its Order as it pertains to the above-referenced terms should therefore be vacated.

Dated: December 2, 2015. Respectfully submitted,



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ADDENDUM

1
2
3
4
5
6 **IN THE UNITED STATES DISTRICT COURT**
7 **FOR THE WESTERN DISTRICT OF WASHINGTON**
8 **IN SEATTLE**

9 SECURE AXCESS, LLC,

10 Plaintiff,

11 v.

12 NINTENDO OF AMERICA, INC.

13 Defendant.

No. C14-1013 RSM

ORDER ON CLAIM
CONSTRUCTION

14
15 This patent infringement action is before the Court for a ruling on claim construction.
16 The Court held a *Markman*¹ hearing on the claims at issue in this case on March 20, 2015.
17 Having fully considered the parties' memoranda, exhibits, and relevant authority, the Court
18 now issues this Order as to the meaning of the disputed claim terms.

19 **BACKGROUND**

20 Plaintiff Secure Axxess LLC ("Secure Axxess") originally filed this patent
21 infringement action in the Northern District of Texas against Defendants Nintendo of
22 America, Inc. and Nintendo Co., Ltd. (collectively, "Nintendo"), along with twelve retail
23 defendants. On March 7, 2014, Judge Gilstrap for the Northern District of Texas denied a
motion by Nintendo to sever Plaintiff's claims against it and transfer them to this Court.
Judge Gilstrap's order was subsequently overturned by the U.S. Court of Appeals for the

¹ *Markman v. Westview Instruments, Inc.*, 517 U.S. 370 (1996).

1 Federal Circuit, and claims against Nintendo were transferred to this Court on July 2, 2014.
2 *See* Dkt. # 1.

3 Through its First Amended Complaint, Plaintiff alleges that Nintendo has infringed
4 and continues to infringe United States Patent No. 6,522,309 (the “‘309 Patent”), titled
5 “Multiscreen Personal Computer Display Method Apparatus.” Dkt. # 2 (“FAC”), § IV. The
6 ‘309 Patent was issued by the United States Patent and Trademark Office (“USPTO”) on
7 February 18, 2003 to inventor Harold J. Weber as trustee for SavvyStuff Property Trust and
8 later assigned to Secure Axxess on July 30, 2012. *Id.* at ¶¶ 21-24; Dkt. # 20-2 (“‘309
9 Patent”). It teaches a device, which Weber termed a “translative video adaptor,” or “TVA,”
10 for viewing and editing documents simultaneously on two or more screens. The invention is
11 described as a “computer providing multiple display capability where one display presents
12 the current document and another display may show a true display of a previously opened
13 document.” *Id.* at p. 2 (Abstract).²

14 Plaintiff alleges that Nintendo infringes the ‘309 Patent by making, importing, and
15 selling Nintendo DS dual-screen handheld consoles, including Nintendo’s DS, DS Lite, DSi,
16 DSi XL, 3DS, and 3DS XL systems. Dkt. # 2 (“FAC”), § IV. Nintendo’s DS products are
17 based on U.S. Patent No. 7,786,997 (the “‘997 Patent”) filed on August 20, 2004 and issued
18 and assigned to Nintendo Co., Ltd. on August 31, 2010 following initial rejection and
19 amendment. FAC at ¶¶ 30-32.

20 a) Overview of the ‘309 Patent

21 The TVA was inspired by Weber’s apparent frustration with the shortcomings in the
22 ability of PC systems at the time to allow a user to edit a live document while concurrently
23 viewing a separate reference document. While Windows, Linux, and Unix systems allowed
concurrent viewing of documents, Weber opined that these programs were “fraught with a
major shortfall” in their “fragmented screen appearance” and the “distracting need for
switching back and forth” between subwindows. ‘309 Patent at 2:58-65. According to
Weber, these technologies inevitably drove the user to print out a temporary hardcopy of a
reference document, an expedient that he viewed as “wasteful of time and paper” and as
“less efficient to use than what an eye-level on screen presentation of an immediate
predecessory document could provide.” *Id.* at 3:13-16. While dual-display systems presented

² The ‘309 Patent’s Abstract further describes the “computer” as “a singular processed video data signal source which presents a primary monitor with current video data.” ‘309 Patent at Abstract.

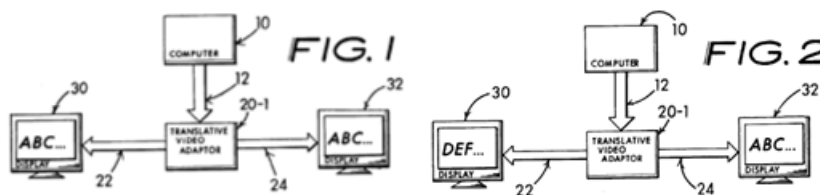
an obvious solution, they were at the time plagued with obstacles, including complicated system configurations and the need to use more than one, then-expensive graphics adapter card to feed data from the computer for separate display on the monitors. *Id.* at 3-4.

Weber's invention represented a workaround to these various limitations. The TVA essentially functions by splitting a computer's data stream on its way to the monitor, allowing the computer to send the same data to be read out on two or more monitors. With the TVA in place, the user opens her desired data file, which is presented on the primary monitor. When the user encounters a screen of information that she wishes to employ as a reference, she "grabs" the video signal being fed through the TVA. The TVA stores and sends the grabbed screen image to the secondary display monitor, where the image is held in place as a reference while the user continues to work on the first monitor. *See '309 id.* at 4:42-51 & Abstract.

Weber coined the term TVA to describe the invention's technical performance, which the patent describes as follows:

In effect, my TVA accepts the processed video signal from the computer, firstly translates the video signal into a binary formation for digital memory storage. The digital memory is subsequently read-out and the retrieved binary format data is then secondly translated back into a reconstructed processed video signal format that serves to drive the secondary, or antecedent display monitor and closely replicate the predecessor screen of data.

Id. at 9:44-64. The function of the TVA, coupled with an existing computer and two monitors, is depicted in Figures 1 and 2:



The Patent's specification teaches two basic physical embodiments for the TVA. Weber termed the first an "external TVA interface" and described it as the "preferred embodiment of [his] invention." *Id.* at 6:17, 6:30-32. This external TVA is a "standalone accessory device," about the size of a deck of cards, which plugs into the computer and two or more monitors through video cabling. *Id.* at 6:30-32. Using the external TVA, a user can activate the frame-grab by clicking a separate control button (i.e. an accessory mouse) or by executing a unique keystroke sequence on the keyboard, using a transient stay resident

1 (“TSR”) software program. *Id.* at 6:50-63. The second embodiment, an “internal TVA,”
2 functions identically to the external TVA except that it is installed as a removable “plug-in
3 circuit card” into one of the computer’s video card slots. *Id.* at 7:7-20.

4 Two particular features of the TVA are described as significant advantages over prior
5 art. First, the TVA is designed to be independent of the computer’s operating system such
6 that it can function on virtually any operating system, including Windows, MS-DOS, Unix,
7 and Linux. *Id.* at 12:66-13:5. Second, Weber emphasized that, whether external or internal,
8 the TVA “strictly samples the real-time, processed and monitor-ready video data signal
9 ordinarily delivered from the output of the video adapter card.” *Id.* at 7:37-39. In other
10 words, the TVA makes use of the primary monitor’s fully processed video data stream, as
11 opposed to obtaining the raw video data signal from the computer’s internal data bus stream.
12 By using the monitor-ready video data, the TVA can avoid processing and display errors and
13 ensure that an exact replica of the primary monitor screen is displayed on the secondary
14 monitor. *See id.* at 10:55-59 (“The eloquence of my invention is that a faithful duplication of
15 whatever video processing the computer’s usual built-in video circuitry provides is
16 absolutely duplicated so as to precisely replicate the primary display presentation on the
17 secondary display monitor.”).

18 The Patent also anticipated specified further uses of the technology, such as the
19 ability to alternate the designation of the primary and secondary (as well as tertiary and other
20 additional) monitors. In other words, the user would be able to initiate a command
21 whereupon the primary monitor becomes the secondary monitor, and vice versa. *Id.* at
22 11:59-67.

23 **b) Claim Disputes**

The ‘309 Patent recites twenty claims. The parties have been unable to agree on the
construction of any claim terms. *See* Dkt. # 20, p. 1. They have also been unable to agree on
the ten most important disputed claim terms. *See* Local Patent Rule 132 (“The Court will
construe a maximum of ten claim terms at the initial Markman hearing, unless the Court
determines otherwise.”). The parties agree only that the Court should construe the claim term
“translative video adapter (TVA)” (Claims 1, 9, and 13).

Secure Axxess submits seven terms in addition to “TVA” that it believes should be construed: (1) first operative means, (2) first conversional means, (3) first memory means, (4) first retrieval means, (5) second conversional means, (6) port, and (7) ported source.

Nintendo asserts that the Court should instead construe the following eight terms at the initial claim construction hearing: (1) predecessor display/supplementary video data/predecessor video data display, (2) first sample of the first screen data/first sample of a first screen portion, (3) TVA input port, (4) video output port/video data signal output port, (5) usually, (6) first converting the first read said first video data signal into a first predecessor video signal/first converting the first read said first stored data into a supplementary display video signal, (7) display-ready first processed video data signal/processed video data signal/display-ready video signal, and (8) intercoupling/intercoupled/coupled. Nintendo additionally asserts that, pursuant to 35 U.S.C. § 112, all of the following “means-plus-function terms” in Claim 13 must at some point be construed by the Court: (1) first operative means, (2) first retrieval means, (3) second conversional means, (4) first conversional means, (5) first memory means, and (6) translatable video adapter (TVA) means.

This Order considers each of the disputed claim terms.

LEGAL STANDARDS

“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004). The meaning and scope of the claim language is a question of law within the exclusive province of the court to determine. *Markman*, 517 U.S. at 372. The inquiry into the meaning of claim terms is an “objective one.” *Innova/Pure Water*, 381 F.3d at 1116. As a result, when a court construes disputed terms, it “looks to those sources available to the public that show what a person of ordinary skill in the art would have understood the disputed claim language to mean.” *Id.*

The appropriate starting point for claim construction is always an examination of the language of the specific asserted claim. *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186 (Fed. Cir. 1998). The words of a claim are to be given their “ordinary and customary meaning,” which is the “meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips v. AWH Corp.*, 415

1 F.3d 1303, 1313 (Fed. Cir. 2015). Such a person is “deemed to have read the claim term not
2 only in the context of the particular claim in which the disputed term appears, but in the
3 context of the entire patent, including the specification.” *Id.*

4 To determine the “ordinary and customary meaning” of a claim term, a court should
5 first consult the intrinsic evidence, which consists of the claims, the specification, and the
6 prosecution history. *Primos, Inc. v. Hunter's Specialties, Inc.* 451 F.3d 841, 847-48
7 (Fed.Cir.2006) (“In ascertaining the ordinary and customary meaning of a claim term, a
8 court's primary focus should be on the intrinsic evidence of record, viz., the claims, the
9 specification, and, if in evidence, the prosecution history.”); *Kinik Co. v. Int'l Trade*
10 *Commission*, 362 F.3d 1359, 1365 (Fed.Cir.2004) (“The words of patent claims have the
11 meaning and scope with which they are used in the specification and the prosecution
12 history.”). Prior art cited to during prosecution is considered part of the prosecution history.
13 *See Phillips*, 415 F.3d at 1317.

14 It is a fundamental precept of claim construction that claims are to be construed in
15 light of the specification presented in the patent document. *Merck & Co., Inc. v. Teva*
16 *Pharms. USA, Inc.*, 347 F.3d 1367, 1370 (Fed.Cir.2003); *Phillips*, 415 F.3d at 1315-16 (“The
17 best source for understanding a technical term is the specification from which it arose,
18 informed, as needed, by the prosecution history.”) (quoting *Multiform Desiccants*, 133 F.3d
19 at 1478). In particular, coined terms and idiosyncratic language employed by the inventor are
20 “best understood by reference to the specification.” *3M Innovative Properties Co. v.*
21 *Tredegear Corp.*, 725 F.3d 1315, 1321 (Fed. Cir. 2013).

22 Where a patentee has provided her own definitions for claim terms, the claim is
23 construed according to the patentee's expressed intent, even if the resulting construction
18 departs from the ordinary meaning of the claim language. *Phillips*, 415 F.3d at 1316;
19 *Honeywell Int'l, Inc. v. Universal Avionics Sys. Corp.*, 493 F.3d 1358, 1361 (Fed.Cir.2007)
20 (“When a patentee defines a claim term, the patentee's definition governs, even if it is
21 contrary to the conventional meaning of the term.”) “The applicant may also act as his own
22 lexicographer and use the specification to implicitly or explicitly supply new meanings for
23 terms.” *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1367 (Fed.Cir.2003).

Though claims should be interpreted in light of the specification, it is not generally
appropriate to import limitations from the specification into the claims. *North American*

1 *Container, Inc. v. Plastipak Packaging, Inc.*, 415 F.3d 1335, 1348 (Fed.Cir.2005) (“[U]nless
2 required by the specification, limitations that do not otherwise appear in the claims should
3 not be imported into the claims.”); *Prima Tek II, L.L.C. v. Polypap, S.A.R.L.*, 412 F.3d 1284,
4 1289 (Fed.Cir.2005) (“We have repeatedly made clear that limitations cannot be imported
5 from the specification into the claims.”); *SciMed Life Systems, Inc. v. Advanced*
6 *Cardiovascular Systems, Inc.*, 242 F.3d 1337, 1340 (Fed.Cir.2001) (referring to the
7 plaintiff’s characterization of reading a limitation from the written description into the claims
8 as “one of the cardinal sins of patent law”).

9 At the same time, “the claims cannot be broader in scope than the invention that is set
10 forth in the specification.” *On Demand Machine v. Ingram Industries*, 442 F. 3d 1331, 1340
11 (Fed. Cir.2006). The determination of balance point between these two considerations—
12 interpreting the claims in light of the specification, on the one hand, and guarding against
13 improperly importing limitations from the specifications into the claims—turns on “how the
14 specification characterizes the claimed invention.” *Alloc, Inc., v. International Trade*
15 *Commission*, 342 F. 3d 1361, 1370 (Fed.Cir. 2003).

16 The scope of a claim is usually not limited to the particular embodiment or
17 embodiments described in the specification. *See, e.g., Resonate Inc. v. Alteon Websystems,*
18 *Inc.*, 338 F.3d 1360, 1364-65 (Fed.Cir.2003) (“[A] particular embodiment appearing in the
19 written description may not be read into a claim when the claim language is broader than the
20 embodiment.”) In order to determine whether the limitations of an embodiment should be
21 applied to a claim, a court must determine whether a person of skill in the art would consider
22 the embodiments to be merely exemplary, or whether they are intended to define the scope
23 of the claim. *Phillips*, 415 F.3d at 1323; *Pfizer, Inc. v. Ranbaxy Labs. Ltd.*, 457 F.3d 1284,
1290 (Fed.Cir.2006).

24 The prosecution history, also part of the intrinsic evidence, may “inform the meaning
25 of the claim language by demonstrating how the inventor understood the invention and
26 whether the inventor limited the invention in the course of prosecution, making the claim
27 scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; *see also Invitrogen*
28 *Corp.*, 327 F.3d at 1367 (“[A]n applicant may actually disclaim claim scope during
29 prosecution.”). However, the prosecution history “often lacks the clarity of the specification
30 and thus is less useful for claim construction purposes.” *Phillips*, 415 F.3d at 1317.

1 While a district court may consult extrinsic evidence as part of the claim construction
2 analysis, such evidence is considered less reliable than the intrinsic evidence. *Id.* at 1317-19
3 (“[T]he court should keep in mind the flaws inherent in each type of [extrinsic] evidence and
4 assess that evidence accordingly.”). “Extrinsic evidence is that evidence which is external to
5 the patent and file history, such as expert testimony, inventor testimony, dictionaries, and
6 technical treatises and articles.” *Vitronics*, 90 F.3d at 1584.

7 Among available extrinsic evidence, the court may use general purpose dictionaries
8 as an aid to claim construction, so long as the dictionary definition relied upon does not
9 contradict the definition indicated by the intrinsic evidence. *See id.* at 1322-23 (stating that
10 courts “may ... rely on dictionary definitions when construing claim terms, so long as the
11 dictionary definition does not contradict any definition found in or ascertained by a reading
12 of the patent documents.”). The Federal Circuit has specifically noted that dictionaries may
13 be useful in the construction of ordinary, non-technical terms, which often involves “little
14 more than the application of the widely accepted meaning of commonly understood words.”
15 *Id.* at 1314; *see also*, *Agfa Corp. v. Creo Prods. Inc.*, 451 F.3d 1366, 1376 (Fed.Cir.2006)
16 (affirming district court construction of “stack” based on dictionary definition); *Ormco
17 Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1306 (Fed.Cir.2006) (using dictionary definition
18 in construction of claim term “geometry”). However, excessive reliance on dictionary
19 definitions is improper because the “ordinary meaning” of a claim term is not the abstract
20 dictionary definition, but the “meaning to the ordinary artisan after reading the entire
21 patent.” *Phillips*, 415 F.3d at 1321.

22 These numerous guidelines notwithstanding, “there is no magic formula or catechism
23 for conducting claim construction,” and a court is not “barred from considering any
particular sources or required to analyze sources in any specific sequence, as long as those
sources are not used to contradict claim meaning that is unambiguous in light of the intrinsic
evidence.” *Id.* at 1324. Instead “what matters is for the court to attach the appropriate weight
... to those sources in light of the statutes and policies that inform patent law.” *Id.*

ANALYSIS

Before turning to the specific claim terms at issue, the Court resolves two
overarching areas of dispute between the parties: (1) whether the ‘309 Patent solely claims
an accessory hardware device or whether the TVA can also be embodied as a software

1 solution, and (2) whether the Patent limits the TVA to providing a non-interactive link
2 between the computer and a passive display monitor or whether it can support bidirectional
3 flow of information.

4 In answer to this first question, the language of the claims as well as the patent
5 specification provide repeated references to the TVA as an accessory hardware device added
6 to an existing computer. Claim 1, for instance, distinguishes the TVA from the physically
7 and functionally separate computer to which the TVA device is attached. *See* '309 Patent at
8 24:55-56 (claiming a "multiple monitor video display method for use with a computer").
9 Other claims make clear that the TVA is a distinct device that is "physically intercoupled"
10 with the computer and monitors through various data ports. *See, e.g.,* Claim 9, *id.* at 27:1-3
11 (claiming the step of "intercoupling the display-ready video signal between the video output
12 port, a [TVA] and the first monitor").

13 The specification, in light of which the Court interprets the claims, *Phillips*, 415 F.3d
14 at 1313, also makes repeated reference to the TVA as a device distinct from the computer.
15 The TVA is described, for instance, as a "standalone peripheral." *Id.* at Abstract. Both the
16 external and internal embodiments set forth in detail in the specification contemplate the
17 invention as a distinct accessory device. *See, e.g., id.* at 6:30-44 ("A preferred embodiment
18 for my invention is as a standalone accessory device that simply plugs in series with the
19 video cabling"); *id.* at 9:65-10:7 ("[M]y TVA may be conveniently built upon a plug-in
20 printed circuit assembly which is temporarily inserted into one of the available expansion
21 bus slots ordinarily associated with a typical personal computer."); *id.* at 7:13-17 (explaining
22 that the internal "TVA essentially taps-into and accepts a sample of display-ready processed
23 video which ordinarily routes from the computer's usual video processor circuitry directly to
the primary video monitor for immediate presentation"); 7:35-39 ("It is urgent to realize and
bears repeating that my invention, whether internally mounted as a plugin card or externally
located, strictly samples the real-time process and monitor ready video data signal....").

While the external TVA is inherently physically distinct, the specification makes
clear that the internal nature of the second TVA embodiment does not transmogrify the
device from hardware into software simply because it is inserted into the computer's card
reader. Much like a USB flash drive, the TVA exists as a removable hardware accessory
device regardless of the fact that it functions by being inserted into a computer's data port.

1 See *id.* at 22:60-62 (“It is well known practice to use the expansion bus 334 for purpose of
2 adding accessory cards and this is no exception.”) (emphasis added). The Patent’s depiction
3 of the two TVA embodiments makes clear the device’s singular accessory nature: in the
4 internal embodiments, the TVA is shown as a “plug-in printed circuit card,” *id.* at Fig. 16 &
5 22:56-58, while in the functionally identical external embodiment, the TVA is shown as a
“separate freestanding device,” *id.* at Fig. 17 & 23:31-33.

6 The Patent’s descriptions of the TVA’s functionality also emphasize that it functions
7 independently from the computer and its operating systems, rather than as either hardware
8 that is part of the computer itself or as software that runs on the computer. See, *id.* at 14:64-
9 66 (“The Fig. 1 depiction shall underscore a key aspect of my invention that being the TVA
20-1 is *functionally distinct* from computer 10.”) (emphasis added). Indeed, Weber
10 emphasized the accessory nature of the TVA as integral to its advances over prior art, by
11 allowing the device to function flexibly on any operating system. See *id.* at 6:18-29
12 (providing that the “paramount advantage” of the TVA is its ability to function “equally well
with any operating system and in any computer hardware configuration”); 23:62-66
(describing the TVA as “merely an accessory to the computer 360”).

13 Given that the Patent clearly specifies the TVA’s essential accessory nature, Secure
14 Axxess’s contention that the Patent claims both software and hardware solutions is not
15 surprisingly without support in the intrinsic evidence. Secure Axxess relies on the portions of
16 the specification that describe a “Transient Stay Resident” (TSR) software program. The
17 TSR program, which is run on the computer itself, allows the user to execute a keyboard
18 sequence in order to command the grabbing of a video frame fed onto the primary monitor.
19 See *id.* at 7:52-55 (“With the internally located TVA a [TSR] subroutine program may
conveniently serve to implement video frame grabbing in unique response to certain
predeterminable patterns of keystroke sequence entries.”).

20 Contrary to Secure Axxess’s representations, the specification makes clear that the
21 TSR is not part of the TVA itself but is instead a separate software solution that provides one
22 means by which the TVA can be “trigger[ed].” *Id.* at 7:57-61 (“Although a TSR triggered
23 instruction obtained from the computer’s control bus is utilized to trigger my invention into
action it remains to be absolutely understood that it is the post-processed video signal which
is grabbed, sampled, and temporarily stored.”). The sole figure depicting the role of the TSR

1 software, Figure 7, also clearly shows that the TSR software is run on computer 10, which is
2 visibly distinct from TVA 50. *See id.* at Fig. 7; *see also id.* at 16:43-44 (explaining that in
3 Figure 7, “a TSR software program 11 is appears [sic] loaded into the computer 10”); 12:49-
4 60 (“[A] programmer may create a TSR software routine which can be installed in the
5 computer.”).

6 The second question – whether the TVA can support bidirectional flow of
7 information – is directly answered by reference to the prosecution history. The Patent’s
8 depiction of the TVA’s operations clearly shows information flowing only in one direction,
9 from the computer through the TVA to the display monitors. *See, e.g., id.* at Figs. 5-7. While
10 the Patent document in one place describes a TVA embodiment as containing a “bi-
11 directional data line,” *id.* at 19:51-55, Weber explicitly disavowed bidirectional functionality
12 during the prosecution of the Patent in order to distinguish his invention from prior art. He
13 did so by emphasizing that the TVA “serves as a **NON**-interactive link between the
14 processed video signal output port” and the passive monitor. *See* Dkt. # 20, Ex. C at p. 60
15 (emphasis in original). Weber made this clarification after the examiner initially rejected his
16 pending claims in light of a prior “Obata ‘669” patent. *See id.* at p. 57. Weber differentiated
17 his device from that claimed in the Obata patent by explaining that the TVA’s capture of
18 processed data flowing “forth from the computer to a video input port of the display
19 monitor” is “absolutely contrary to the two-way network-style operation here-to-fore taught
20 by and anticipated by the Obata et al ‘669 reference.” *Id.* at 60-61 (emphasis in original).

21 This express disavowal unequivocally limits the scope of the TVA to providing a
22 non-interactive link between processed video signal and a passive display monitor. Even if
23 this limitation were not already clear from the specification, the Court must give affect to
Weber’s disavowal of an interpretation of the TVA to allow bidirectional data flow made
during prosecution in order to obtain claim allowance. *Teleflex, Inc. v. Ficosa No. Am.*
Corp., 299 F.3d 1313, 1326 (Fed. Cir. 2002) (quoting *Standards Oil Co. v. Am. Cyanamid*
Co., 774 F.2d 448, 452 (Fed. Cir. 1985)); *see also Invitrogen Corp.*, 327 F.3d at 1367 (“[A]n
applicant may actually disclaim claim scope during prosecution.”); *Rheox*, 276 F.3d at 1325
 (“Explicit arguments made during prosecution to overcome prior art can lead to narrow
claim interpretations because the public has a right to rely on such definitive statements
made during prosecution.” *Id.* (internal quotation omitted)).

1 Having set forth these interpretations of the overall scope of the claims in the ‘309
2 Patent, the Court turns to construing the particular disputed terms.

3 **(1) Translative Video Adapter (Claims 1, 9, 13)**

4 Both parties agree that this term, which Weber coined to capture his invention,
5 requires construction. Secure Axxess proposes the following construction: “software and/or
6 hardware configured to accept video data for display on a primary video display device,
7 prepare and store the video data in memory, retrieve the stored video data from memory, and
8 prepare and transmit the stored video data for display on a secondary video display device.”
9 *See* Dkt. # 20-1 (Parties’ Joint Claim Construction Chart), at p. 4. Nintendo argues that the
10 term should instead be construed to mean an “accessory device added to an existing
11 computer system that provides a non-interactive link of the processed video signal from the
12 video output port to a passive display monitor.” *Id.*

13 Secure Axxess first contends that Nintendo’s proffered construction of the TVA as an
14 “accessory device” impermissibly imports limitations into claims from embodiments set
15 forth in the specification. The Court disagrees. This is not a case in which a party urges that
16 a claim term be limited to a single preferred embodiment in contravention of the ordinary
17 and accustomed meaning of that term. *Cf. Telflex, Inc.*, 299 F.3d at 1327 (holding that claim
18 terms take on their “ordinary and accustomed meanings unless the patentee demonstrated an
19 intent to deviate” from those meanings). Rather, because “TVA” is a coined term, *id.* at
20 9:55-56, its meaning must derive from the patent itself and not from any common usage. *See*
21 *Mymail*, 476 F.3d at 1376. As noted above, the ‘309 Patent’s claims and specification plainly
22 teach the TVA as an accessory device added to an existing computer, whether as a
23 standalone accessory device (the external embodiment) or through a plug-in card (the
internal embodiment). By extension, the Patent nowhere describes the “software” TVA that
Secure Axxess proposes. Because a coined term may be construed “only as broadly as is
provided for by the patent itself,” *Godlenberg v. Cytogen, Inc.*, 3273 F.3d 1158, 1164 (Fed.
Cir. 2005), the Court declines to adopt Secure Axxess’s construction of the TVA as
“software and/or hardware.”

Secure Axxess also argues that because Claims 1 and 9 are method claims, the TVA
term used in them should be construed functionally. Dkt. # 21, p. 13. As evidence that
Weber sought to purely claim function, Secure Axxess points to the Patent’s generic

1 qualification that “the secondary display operating apparatus might take other forms which
2 can be differently engineered to suit a particular application or meet special operational goals
3 without departing from the fundamental spirit of my invention.” *Id.* at 24:14-27.

4 There are several problems with Secure Axxess’s approach. First, that Claims 1 and 9
5 may be method claims does not mean that they cannot refer to or incorporate structure. *See*
6 *Eaton Corp. v. Rockwell Intern. Corp.*, 323 F.3d 1332, 1339-41 (Fed. Cir. 2003) (noting that
7 “[t]he presence of [specific] structures [in a method claim] permits the performance of the
8 first step of the claimed method” and that the “plain language of the claim requires the
9 operation of this structure as the first step of the claimed method.”). Here, the term TVA
10 appears in Claims 1 and 9 as structure – as a physical device to be “intercoupl[ed] with data
11 signal and a monitor – not as a function. *See* ‘309 Patent at 24:65-6, 27:1-3.

12 Further, purely functional claiming is permitted only where a term is presented as
13 either a “means-plus-function” term or “step-plus-function” term under the requirements of
14 35 U.S.C. § 112(f). In drafting a “means-plus-function” claim, such as Claim 13, the
15 patentee is required to link the claimed function to associated structure set forth in the
16 specification. *Noah Systems, Inc. v. Intuit Inc.*, 675 F.3d 1302, 1318 (Fed. Cir. 2012).
17 “Requiring the disclosure of a corresponding structure, thus, confines the breadth of
18 protection otherwise permitted by purely functional claiming.” *Id.* (internal quotations
19 omitted). Claims 1 and 9 are not drafted as mean-plus-function claims.

20 Finally, reading generic functional claiming language in the specification to enlarge
21 the scope of the claimed invention would undermine the notice function of the patent. *See*
22 *Johnson & Johnston Associates Inc. v. R.E. Service. Co., Inc.*, 285 F.3d 1046, 1052 (Fed.
23 Cir. 2002) (“The claims thus give notice of the scope of patent protection.”). The
specification may be referred to in order to limit the claim but “can never be made available
to expand it.” *McClain v. Ortmyer*, 141 U.S. 419, 424 (1891); *see also SciMed Life*
Systems, Inc. v. Advanced Cardiovascular Systems, Inc., 242 F.3d 1337, 1341 (Fed. Cir.
2001) (“Where the specification makes clear that the invention does not include a particular
feature, that feature is deemed to be outside the reach of the claims of the patent, even
though the language of the claims, read without reference to the specification, might be
considered broad enough to encompass the feature in question.”). The Court thus rejects the
proposition that the specification’s generic reservation can be used to expand the scope of

claims such that they become entirely untethered from the embodiments described in the specification. *See id.* at 1344 (holding, despite the presence of a generic reservation in the patent, that the scope of the asserted claims was limited to a preferred embodiment); *see also Wang Laboratories, Inc. v. America Online, Inc.*, 197 F.3d 1377, 1383 (Fed. Cir. 1999); *Embs v. Jordan Outdoor Enterprises, Ltd.*, 617 F.Supp.2d 680, 693 (S.D. Ohio 2008).

The Court thus turns to the remaining portions of the parties' proposed constructions for the TVA term. For the reasons set forth above, the Court is persuaded by its reading of the prosecution history that the inventor disclaimed any bidirectional data flow capability in distinguishing the '309 Patent from prior art. In accordance with this disavowal, the Court determines that the TVA is limited to a "non-interactive link" connected to the computer's "video output port." *See* Dkt. # 20, Ex. C, p. 60 ("[A TVA] serves as a **NON**-interactive link between the processed video signal output port and a mere passive display monitor.") (emphasis in original).

Similarly, the prosecution history and the patent language unambiguously require that the TVA be connected to the computer's "video output port" so that it can sample video signals "directly from the computer system's primary display monitor's fully processed video data stream, as opposed to obtaining the raw video data signal from the computer's internal data bus signals." '309 Patent at 6:10-14; *see also*, 7:61-63. Indeed, the Patent describes the TVA's limitation to sampling processed video signal from the video output port as essential to "avoid[ing] a variety of predecessor display errors" which sampling from "raw bus signals" would introduce. *Id.* at 7:29-32.

The Court finds that Nintendo's proposed construction properly encapsulates these essential structural limitations, which are left out of Secure Axxess's proposed construction. The Court accordingly adopts Nintendo's construction and construes the term "TVA" to mean an "accessory device added to an existing computer system that provides a non-interactive link of the processed video signal from the video output port to a passive display monitor."

(2) Predecessory Display/Supplementary Video Data/Predecessory Video Data Display (Claims 1, 9, and 13)

Only Nintendo asserts that these terms require construction, while Secure Axxess contends that they require no construction beyond their plain and ordinary meaning.

1 Nintendo proposes the following construction: “static and accurate replication of a single full
2 frame previously displayed on a different monitor.”

3 The Court agrees with Nintendo that it is appropriate to construe these terms at this
4 stage of the proceeding. The term “predecessory” in particular was coined by the inventor
5 and has no meaning outside the Patent. Further, the parties dispute Nintendo’s proposed
6 construction of these terms as limited to a “static” replication of a “single full frame.” Such
7 disputes over the scope of claims must be resolved by the court and not left to the jury to
8 determine. *See Pressure Prods. Med. Supplies, Inc. v. Greatbatch Ltd.*, 599 F.3d 1308, 1316
(Fed. Cir. 2010) (“[W]hen the parties raise an actual dispute regarding the proper scope of
these claims, the court, not the jury, must resolve the dispute.”) (internal quotations omitted).

9 Here, the Court agrees with Nintendo’s proposed construction. First, the claims
10 themselves require that the predecessory or supplementary image is first displayed on a
11 different monitor before being displayed on the second monitor. *See* ‘309 Patent at Claim 1,
12 24:54-25:16 (claiming steps of “first displaying the first processed video data signal on the
13 first monitor as the real time display,” “reading” the video data, “converting it into a “first
14 predecessory video signal,” and “displaying the first predecessory video signal on a second
monitor as the first predecessory display.”); *see also* Claims 9 & 13; 5:34-36 (“predecessory
refers to a historical store or supplementary display of video data”).

15 Second, the specification throughout describes the predecessory display as a static
16 image and as an accurate replication of a previous frame. *See, e.g., id.* at 7:39-43 (“My TVA
17 stores a true ‘what you see’ frame sample for subsequent ‘what you get’ display on a second
18 monitor as an accurate replica of a predecessory image that has been recently displayed on
19 the primary monitor.”); 4:44-60 (“[Y]ou grab the video signal and store it for readout and
20 replicate display on the secondary monitor. In effect the display becomes ‘locked onto’ the
21 secondary monitor.”) (emphasis added). The prosecution history confirms these attributes.
22 *See* Dkt. # 20, Ex. C at p. 61 (“The eloquence of my invention is that a faithful duplication of
23 whatever video processing the computer’s usual built-in video circuitry provides is
absolutely duplicated so as to precisely replicate the primary [] display presentation on the
secondary monitor.”). The static nature of the predecessory display flows from the TVA’s
limitation to providing a “non-interactive” link from the data source to the display monitor.

1 Third, reading these terms in light of the specification makes clear that the
2 predecessor display is limited to providing a full screen display. Indeed, the Patent
3 describes the “supplementary full screen display[] of portions of a document” as “the utter
4 essence” of the claimed invention. ‘309 Patent at 24:7-11; *see also, id.* at 6:45 (“TVA Stores
5 Full Video Screen Frame”); 9:47-53 (“The stored data are subsequently read-out and
6 displayed on the secondary (i.e. supplementary or satellite) monitor to serve to display full
7 screens of pre-occurring reference information....”).

8 Secure Axxess nonetheless points to the Patent’s use of the verb “sample” to argue
9 that the predecessor display need not be limited to a full screen. The Court finds this
10 reference inapposite. The specification employs the verb “sample” in reference to the
11 sampling of the processed video data stream. *See id.* at 6:9-14 (discussing the sampling of
12 “fully processed video data stream”); 7:13-15 (“the TVA essentially taps-into and accepts a
13 sample of display-ready processed video”). In other words, the user executes a command to
14 sample, or grab, from the video data stream the full screen of data displayed on an initial
15 monitor. In accordance with this prescribed limitation, the Patent consistently depicts a full
16 frame on a primary monitor being exactly replicated onto the secondary monitor. *See id.* at
17 Figs. 1-3. As the Patent nowhere discloses a method for capturing only a portion of a full-
18 frame image, the Court declines Secure Axxess’s invitation to read the scope of the claims
19 more broadly than the specification provides.

20 Finally, the Court agrees with Nintendo that the terms “predecessory display” and
21 “supplementary display” should be construed interchangeably. “[C]laim drafters can [] use
22 different terms to define the exact same subject matter.” *Curtiss-Wright Flow Control Corp.*
23 *v. Veland, Inc.*, 438 F.3d 1374, 1380-81 (Fed. Cir. 2006). Such is the case here. Claim 9, for
instance, uses the term “supplementary display” in the precise fashion in which the term
“predecessory display” is used in Claim 1. *Compare*, ‘309 Patent at 25:13-15 (claiming steps
of “converting the first read said first video data signal into a first predecessor video signal”
and “displaying the first predecessor video signal on a second monitor as the first
predecessory display”) *with* 27:16-19 (claiming steps of “converting the first read said first
stored data into a supplementary display video signal” and “rendering the supplementary
display video signal on the second monitor”). The specification confirms that these terms

1 have the same meaning. *See, e.g.*, 5:35-36 (“predecessory refers to a history store or
2 supplementary display of video data”); 24:34-48.

3 The Court finds Nintendo’s construction of these terms to be that contemplated by
4 the inventor and necessitated by the specification. The Court accordingly adopts Nintendo’s
5 construction of these “predecessory” terms, which are construed to mean the “static and
6 accurate replication of a single full frame previously displayed on a different monitor.”

7 **(3) First sample of first screen portion/first sample of first screen data signal**
8 **(Claims 1 and 9)**

9 Again only Nintendo asserts that these terms require construction. Nintendo proposes
10 the following construction: “static and accurate replication of a single full frame previously
11 displayed on a different monitor.”

12 The dispute over the construction of these claim terms mirrors the dispute over the
13 “predecessory” terms discussed above. Nintendo asserts that these terms should be construed
14 to incorporate the “static and accurate” and “full image” requirements of the “predecessory”
15 and “supplementary” display terms. According to Nintendo, these requirements flow directly
16 from the language of Claims 1 and 9, which makes clear that these “first sample[s]” are
17 stored into memory and subsequently read out as a “predecessory” or “supplementary”
18 display. Secure Access, by contrast, asserts that these terms, if in need of construction,
19 should be construed to make clear that Mr. Weber’s invention enables a computer user “to
20 select a first sample of a first screen portion.” Dkt. # 24, p. 10.

21 The Court agrees with Nintendo that it is appropriate to construe these terms, in light
22 of the ambiguity in the term “sample” and the parties’ evident dispute with respect to its
23 scope. *See Pressure Prods. Med. Supplies, Inc.*, 599 F.3d at 1316. For the reasons set forth
above with respect to the “predecessory” terms, the Court is also persuaded that Nintendo’s
construction is the correct one. It is clear from the language of the claims and from the
specification that the “sampling” referred to in the Patent is the sampling of full frames of
data from the processed data stream. *See, e.g.*, ‘309 Patent at 24:7-14. The context of Claim
1 makes clear that the term “portion” refers to the user’s ability to select a “portion” of
processed video data signal, not to a “portion” of the image displayed on a first monitor. *See*
25:1-3 (“first enabling the computer user to select a first sample of a first screen portion *of*
the first processed data signal”) (emphasis added).

1 The Court accordingly adopts Nintendo's construction and construes the terms "first
2 sample of a first screen portion/ first sample of the first screen data signal" to mean "first
3 static and accurate replication of a single full image of a first screen frame."

4 **(4) Port Terms (Claim 1, 9, and 13)**

5 The term "port" is used in five places in Claim 1, 9 and 13. Secure Axxess asks the
6 Court to construe this term in isolation to mean: "Any internal or external data channel
7 through which data enters or exits." Nintendo instead points out that the term "port" is never
8 given independent significance in the claims but is instead always attached to a specific type
9 of port (e.g., the TVA input port and the video signal output port). Nintendo therefore asks
10 the Court to construe the word "port" in the asserted claims in the context of the specific
11 types of ports being claimed.

12 As the term "port" is always claimed as a particular type of port and modified by
13 other terms, the Court agrees that construing the term "port" in isolation would lead to an
14 overly broad construction and one ultimately unhelpful for the trier of fact. The Court
15 accordingly follows Nintendo's suggestion and construes each of the following "port" terms
16 in context.

17 **(a) TVA Input Port (Claims 1 and 2)**

18 While Secure Axxess urges no interpretation of this term beyond its proposed
19 independent construction of the term "port," Nintendo proposes that the term "TVA Input
20 Port" be given the following construction: "an input termination or connection point in the
21 TVA that allows for a device to be detachably connected to the TVA."

22 Secure Axxess contends that Nintendo's proposed construction makes little sense
23 because "Mr. Weber patented a *method*." Dkt. # 24, p. 10 (emphasis in original). As such,
the TVA, according to Secure Axxess, cannot be detachable because Weber intended to
describe it solely in terms of its function. The Court disagrees. As discussed above, structural
detail is routinely included in method claims. Indeed, recitation of structure is often
necessary, for it may be through the presence of certain structures that the steps of a claimed
method are performed. *See Eaton Corp.*, 323 F.3d at 1339 ("The presence of these structures
permits the performance of the first step of the claimed method....").

Here, it is clear from the language of Claims 1 and 2 that both the TVA and the
"TVA input port" are structures necessary to the performance of the steps of the claimed

1 method. The “TVA input port” is “intercoupled” in both these claims with the “processed
2 video data signal” from the computer. *See* ‘309 Patent at 25:1-4; 25:19-21. In other words, it
3 is the presence of the “TVA input port” that allows for the TVA to be attached to a device in
4 order to receive the processed video signal to be read out onto a secondary monitor.

5 The specification also makes clear the detachable nature of the TVA, which is
6 connected to a device through its input port. Both the external and internal TVA
7 embodiments (the only two embodiments disclosed in the Patent) are described as being
8 detachably connected to the computer via an input port. For instance, the “freestanding”
9 external TVA is “coupled” with the computer through a “cable [] with an input into the TVA
10 [.]” *Id.* at 23:36-38. Likewise, the internal TVA embodiment is described as containing a
11 “necessary third connector (actually the input to the TVA).” *Id.* at 23:19. This detachable
12 connection is described elsewhere throughout the specification. *See, e.g., id.* at 6:32-35 (“[A]
13 short video ‘jumper’ cable may connect between the computer’s video output
14 connector...and an input to my TVA device.”). Construing the term “TVA input port” to
15 make clear that the TVA may be detachably connected to a computer is thus consistent with
16 the specification, including both embodiments, the accessory nature of the TVA, and the
17 lauded ability of the TVA to function on any operating system. *See Merck & Co., Inc. v.*
18 *Teva Pharms. USA, Inc.*, 347 F.3d 1367, 1371 (Fed. Cir. 2003) (“[C]laims must be construed
19 to be consistent with the specification, of which they are a part.”).

20 Accordingly, the Court adopts Nintendo’s proposed construction and construes the
21 term “TVA input port” to mean: “an input terminal or connection point in the TVA that
22 allows for a device to be detachably connected to the TVA.”

23 (5) Video Output Port/Video Data Signal Output Port (Claims 9 and 13)

While Secure Access argues that no construction is necessary for these terms beyond
that proposed for the term “port,” Nintendo proposes that the terms be construed as “an
output terminal or connection point adapted to be detachably connected to a monitor.”

As used in the claims, the terms “video output port” and “video data signal output
port” plainly provide the connecting point between the TVA and the monitor, consistent with
Nintendo’s proposed construction. *See* ‘309 Patent at 27:1-3 (claiming the step of
“intercoupling the display-read video signal between the video output port, a translatable
video adapter (TVA) and the first monitor); 27:63-65 (claiming “a primary monitor means

1 coupled with the first processed video data signal output port and producing an immediate
2 display of the processed video data signal”).

3 Nintendo’s proposed construction is also consistent with the specification, every
4 embodiment of which includes an output port that allows the TVA to physically connect to a
5 monitor. *See, e.g.*, ‘309 Patent at Abstract (“The device is preferably configured as a
6 standalone peripheral, having two video ports connected essentially between the computer’s
7 ‘video output port” and a third video port coupled with the secondary monitor’s ‘video
8 input’ port.”); 6:30-30 (“A preferred embodiment for my invention is as a standalone
9 accessory device that simply plugs in series with the video cabling...The primary monitor
10 and secondary monitor then each plug into appropriate mating connectors outputted from my
11 TVA device”); 10:19-21 (“The original or principal VGA video monitor is subsequently
12 plugged into a connector provided on my TVA card.”); 18:19-23.

13 The Court accordingly adopts Nintendo’s proposed construction and construes the
14 terms “video output port” and “video data signal output port” to mean “an output terminal or
15 connection point adapted to be detachably connected to a monitor.”

12 (6) Ported Source (Claim 1)

13 Secure Axxess proposes that “ported source,” which appears only in Claim 1 of the
14 Patent, be construed to mean “any internal or external data channel through which data may
15 be obtained.” Nintendo, by contrast, proposes that the term be construed as a “video output
16 port of a video adapter or graphics accelerator card.”

17 Nintendo contends that Secure Axxess’s construction of “ported source” should be
18 rejected because it is disconnected from the context of the claim language. The Court agrees.
19 Claim 1 recites the steps of “processing computer program data into a ported source of
20 display-ready first processed video data signal,” “intercoupling the ported source of first
21 processed video data signal and the first monitor,” and “intercoupling the ported source of
22 first processed video data signal and a [TVA].” ‘309 Patent at 24:59-60, 24:65-66. In
23 context, the term “ported source,” like “video output port,” provides a connection between
processed video signal and the monitor. The specification limits the source of the processed
video signal to the video adapter card or graphics accelerator card, consistent with
Nintendo’s proposed construction. *See id.* at 7:43-46 (“[T]he INPUT to my TVA device is
derived directly from the OUTPUT of the computer’s usual video adapter card as monitor-

1 ready processed video signal.”); 15:1-4 (“[T]he processed video data signal delivered from
2 the computer is a display-ready video signal which has been processed through a video
3 adapter or ‘graphic accelerator’ card.”).

4 Accordingly, the Court adopts Nintendo’s proposed construction and construes the
5 term “ported source” as a “video output port of a video adapter or graphics accelerator card.”

6 **(7) Usually (Claim 1)**

7 Secure Axxess asserts that this term, which appears only in Claim 1, needs no
8 construction, while Nintendo urges the Court to find that the term is indefinite. As to this
9 term, the Court agrees with Secure Axxess and finds no construction beyond the ordinary
10 meaning of this term necessary. The Court further defers the question of indefiniteness, as it
11 is appropriately resolved at the summary judgment stage rather than through claim
12 construction. *See Exxon Research & Eng’g Co. v. United States*, 265 F.3d 1371, 1376 (Fed.
13 Cir. 2001); *MasterObjects, Inc. v. Yahoo!, Inc.*, 2013 WL 6185475, *1 (N.D. Cal. 2013).

14 **(8) First converting the first read said first video data signal into a first
15 predecessor video signal/first converting the first read said first stored data
16 into a supplementary display video signal (Claims 1 and 9)**

17 Secure Axxess asserts that no construction is necessary as to these terms, while
18 Nintendo proposes the following construction: “reconstructing the stored digital video data
19 signal into an analog first predecessor video signal.”

20 The dispute between the parties as to these claim terms centers on whether the
21 claimed “converting” steps result in an analog signal. The Court agrees with Nintendo that
22 they do. The specification consistently employs the terms “converter” and “conversion” to
23 refer to either analog-to-digital (A/D) or digital-to-analog (D/A) conversion. *See, e.g.*, ‘309
Patent at 9:56-62 (“In effect my TVA accepts the processed video signal from the computer,
first translates the video signal into binary format for digital memory storage. The digital
memory is subsequently read-out and the retrieved binary format data is then secondly
translated back into a reconstructed processed video signal format.”); 10:26-30 (“The
memory is repeatedly read out to three video speed DAC (D/A converters....”); 11:20-24
 (“The stored memory output data are subsequently utilized with a D/A (digital to analog)
converter to reconstruct the analog video signal....”); Fig. 11 (items 74 and 110); 18:65-
19:16.

1 The Court disagrees with Secure Axxess that references in the description to
2 processes through which D/A or A/D conversion is not required, change this result. Secure
3 Axxess points, for instance, to a description of the use of an external adapter coupled with a
4 “TTL signal level video monitor.” *Id.* at 11: 33-37 (“Since the usual video signals are
5 inherently binary in these earlier [TTL] display monitors, they do not require A/D
6 conversion[.]”). This reference is inapposite. First, it is never incorporated into any
7 embodiment set forth by the inventor. Second, the Patent’s discussion of TTL monitors is in
8 relation to a process through which “conversion” is *not* required. That is, the TTL reference
9 does not provide a more expansive construction of “conversion;” rather, it discusses its
10 absence. The Court declines to read the claims so as to obviate the step of “conversion”
11 entirely, as Secure Axxess urges. Reading “conversion” in light of the specification, as the
12 Court must, it is clearly intended to refer to digital-to-analog translation.

13 The Court accordingly adopts Nintendo’s proposal and construes these terms to mean
14 “reconstructing the stored digital video data signal into an analog first predecessor video
15 signal.”

16 (9) Means-Plus-Function Terms (Claim 13)

17 Claim 13 of the ‘309 Patent includes nine terms drafted using means-plus-function
18 claim language, governed by 35 U.S.C. § 112(6). The parties have identified six such terms
19 in their Joint Claim Construction and Prehearing Statement for which they have requested
20 construction. The Court agrees that it may ultimately be necessary to construe all of these
21 terms. *See* 35 U.S.C. § 112(f) (means-plus-function claims “shall be construed to cover the
22 corresponding structure, material, or acts described in the specification”). Nonetheless, as
23 doing so will exceed the maximum ten terms ordinarily construed at this stage, the Court
finds it appropriate to construe only the following three terms at this time, which it finds to
be most relevant to issues dispositive of Claim 13. In identifying corresponding structure, the
Court looks to clear associations between recited function and structure set forth in the
specification or prosecution history. *B. Braun Medical, Inc. v. Abbott Laboratories*, 124 F.3d
1419, 1424 (Fed. Cir. 1997).

24 a. TVA Means

25 The parties disagree as to both the function and corresponding structure for this term.
Nintendo proposes the following function: “Using an accessory device added to an existing

1 computer system to provide a non-interactive link of the processed video signal from the
2 video output port to a passive display monitor,” which it links to the following structures:
3 TVA 330 (Fig. 16) or TVA 370 (Fig. 17). Secure Axxess proposes the following
4 construction: “Accepts video data from a source and provides the video data to one or more
5 displays in response to a bidirectional protocol,” which it links to the following structures:
6 Figs. 7 (Refs. 10, 11, 50) or 12.

7 The parties’ dispute over the functional definition replicates the dispute over the
8 claim term “TVA,” discussed above. For the reasons already stated, the Court adopts
9 Nintendo’s proposed construction, which properly incorporates the inventor’s prosecution
10 disclaimer and tracks the scope of the function set forth for the TVA in the specification. The
11 Court further adopts Nintendo’s proposed structure, which encompasses the only two
12 embodiments of the TVA set forth in the Patent, as shown in Figures 16 and 17. *See* ‘309
13 Patent at 22:56-60, 23:31-33.

14 The Court also agrees with Nintendo that Secure Axxess’s proposal links “TVA
15 means” function to the incorrect structure. Computer 10 in Figure 7, for instance, is the
16 “computer means” referred to in a prior step of Claim 13. *See id.* at 27:61-62. TSR 11 in
17 Figure 7 refers to software run on the Computer 10, which may be used to help initiate a
18 screen grab but which is not part of the TVA means itself. *See id.* at 1:37-41. Further,
19 identification of the entire structure depicted in Figure 12 incorporates additional structure
20 clearly distinct from the TVA, such as the secondary video monitor 32 and serial port
21 connection 150.

22 The Court accordingly adopts Nintendo’s proposed function and structure for “TVA
23 Means.”

b. First Operative Means

19 Nintendo proposes the following functional compromise construction for “First
20 Operative Means”: “Enabling a user to first select and capture a first page sample from the
21 first processed video data signal path.” Nintendo links this function to the following
22 compromise structure: “(1) a dedicated “button,” either an “external button switch” or a
23 “third ‘mouse’ button” (Fig. 5 Accessory Key-Switch 16, Fig. 11 Push button Switch 67,
Fig. 17 Key Button Switch 362), or (2) Fig. 7 Unique Keystroke Entry 15 in combination
with Keyboard 14, and TSR Program 11, either of which is combined with both “Frame

1 Grabber Control Logic” 68 and “Memory Control Logic” 96 in Fig. 11. Secure Axxess
2 proposes the following function: “Enabling the user to [first/second] select and capture a
3 [first/second] accurate replication of a data sample from the [first/second] processed video
4 data signal.” Secure Axxess links this function to the following structure: (1) Fig. 7 Unique
5 Keystroke Entry 15 in combination with Keyboard 14, Computer 10, TSR Program 11, and
6 TVA 50; or (2) Fig. 12 UART 154 in combination with Data Synch and R/W Control Logic
7 190-10.

8 First, the Court adopts Nintendo’s proposed function, which tracks the unambiguous
9 language set forth in Claim 13 itself. ‘309 Patent at 28:5-7. Secure Axxess’s proposed
10 function, by contrast, unjustifiably departs from the plain language of the Claim and
11 introduces unnecessary ambiguity.

12 As to corresponding structure, the Court finds that Nintendo properly identifies the
13 structure associated with “first operative means” function throughout the Patent. The Patent
14 contemplates three alternative structures through which the TVA is initially triggered: a
15 dedicated button, dedicated mouse, or a keystroke sequence. *See id.* at 1:37-41 (“A primary
16 display video screen selection is made by actuation of an auxiliary key-switch associated
17 with the adapter, by a ‘third’ mouse button entry or by a unique keyboard sequence entry
18 processed by a TSR program to enable the necessary function.”); *see also id.* at Abstract
19 (“User selection may be attained by a keyboard key sequence entry, a mouse button click or
20 using an external button-switch”). No other structures for executing the first operative means
21 are identified in the specification, and the Court declines to read Claim 13 more broadly than
22 the Patent allows.

23 As to structure, Nintendo’s proposal properly links the first operative means to these
identified structures through which it is executed. Secure Axxess’s proposal, by contrast,
excludes the external key-switch and mouse button structures associated with the “first
operative means” function throughout the Patent. Secure Axxess also seeks to improperly
associate Computer 10 and TVA 50 with the first operative means function, though both
these structures are associated with separate functions set forth in Claim 13, as discussed
above.

Accordingly, the Court adopts Nintendo’s proposed compromise function and
associated structure for “First Operative Means.”

1 **c. First Conversional Means**

2 Nintendo proposes the following function for the “first conversional means” term:
 3 “Adapting the first page sample of the first processed video data signal into a first storable
 4 video data signal,” which it links to the structure of A/D Converter 74 in Figure 11. Secure
 5 Access proposes the following function: “Adapting the data sampled on the first page of
 6 video data into a first storable video data signal,” which it links with the following structure:
 7 Figure 12 UART 154 in combination with Write Processor 170 and Data Synch R/W
 8 Control Logic 190-1.

9 As to function, the Court again finds it appropriate to adopt Nintendo’s proposal,
 10 which tracks the unambiguous language set forth in the claim. ‘309 Patent at 28:8-10. For
 11 the reasons set forth above with respect to the “conversion” terms, the Court also finds that
 12 the specification necessitates linking the conversional means to the analog-to-digital
 13 conversion structure, as depicted in Figure 11. *See id.* at 11:12-15 (“In this preferable
 14 arrangement, the video signal coupled with the TVA is ordinarily in analog format and
 15 suitable A/D (analog to digital) conversion is performed.”); 18:44-53. Further, the Court
 16 finds that Secure Access incorrectly attempts to associate Figure 12 with Claim 13. Claim 13
 17 requires a “computer means including a first processed video data signal output port,” which
 18 is depicted in Figure 11 but noticeably absent from Figure 12, an alternative serial port
 19 embodiment that does not include a video data signal output port.

20 The Court accordingly adopts Nintendo’s proposed structure and function for the
 21 “first conversional means” term.

22 **(10) Display-ready first processed video data signal/processed video data
 23 signal/display ready video signal (Claims 1, 9, 13)**

The Court finds construction of these terms, urged only by Nintendo, to be
 duplicative with construction of the “First converting the first read said first video data
 signal into a first predecessor video signal” terms discussed above. As the Court has
 already reached the ten terms ordinarily construed as this stage, *see* Local Patent Rule 132,
 the Court declines to construe these terms at this time.

(11) Intercoupling/intercoupled/coupled (Claims 1, 9, and 13)

Having reached the ordinary ten term maximum at the claim construction stage, *see*
 Local Patent Rule 132, the Court declines to construe these claims at this time.

1 (12) **Predecessory video signal/supplementary display video signal (Claims 1 and 9)**

2 The Court finds construction of these terms to be duplicative with construction of the
3 “predecessory” terms discussed above. Having already reached the ordinary maximum of ten
4 terms to be construed at this stage, *see* Local Patent Rule 132, the Court declines to
separately construe these terms at this time.

5 **CONCLUSION**

6 For the reasons stated herein, the Court hereby ORDERS that the disputed claim
terms are construed as set forth above.

7
8 Dated this 8th day of July 2015.

9 

10 RICARDO S. MARTINEZ
11 UNITED STATES DISTRICT JUDGE
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(12) **United States Patent**
Weber

(10) **Patent No.:** **US 6,522,309 B1**
(45) **Date of Patent:** **Feb. 18, 2003**

(54) **MULTISCREEN PERSONAL COMPUTER
DISPLAY METHOD AND APPARATUS**

(75) Inventor: **Harold J. Weber**, Centerville, MA
(US)

(73) Assignee: **Savvy Stuff Property Trust**,
Centerville, MA (US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/515,081**

(22) Filed: **Feb. 28, 2000**

(51) Int. Cl.⁷ **G09G 5/00**

(52) U.S. Cl. **345/1.1; 345/2.1**

(58) Field of Search 345/1.1, 1.2, 1.3,
345/2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 3.4

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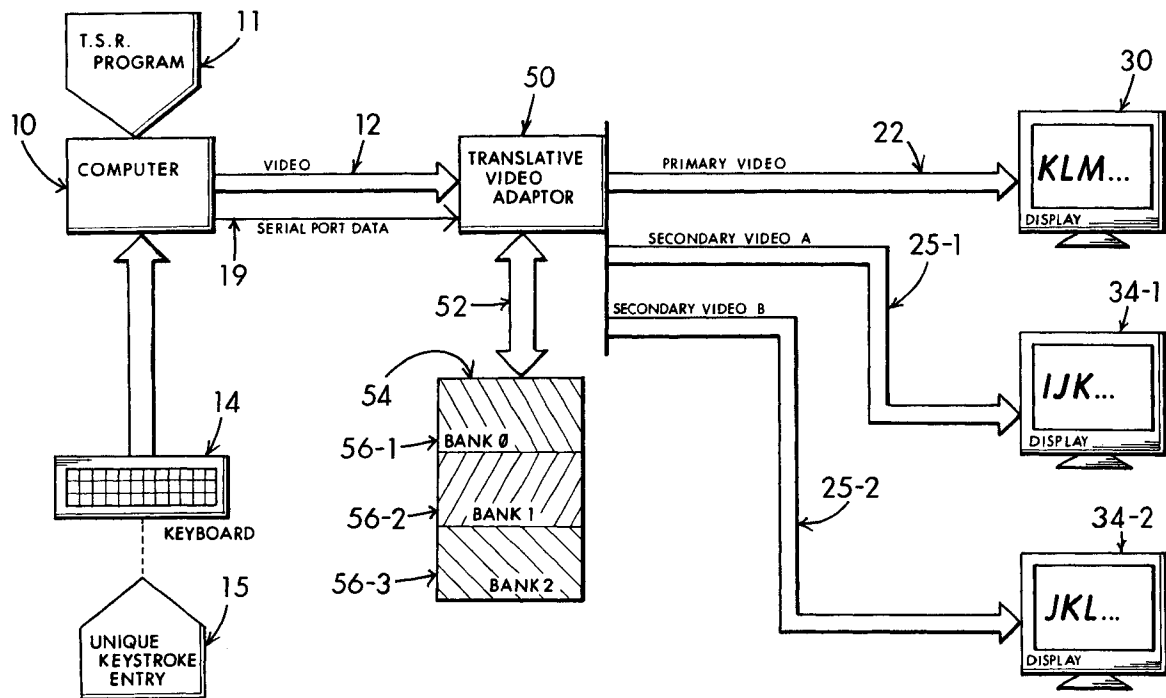
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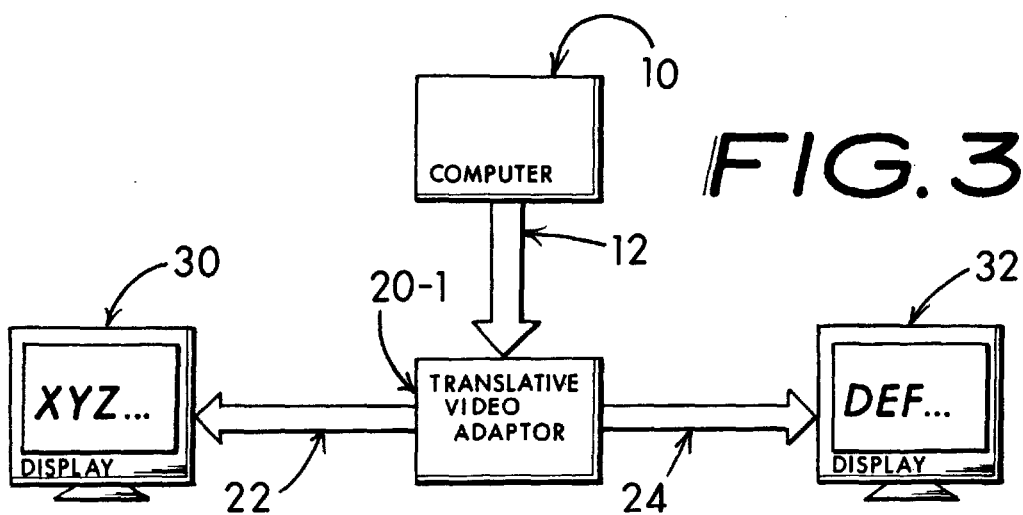
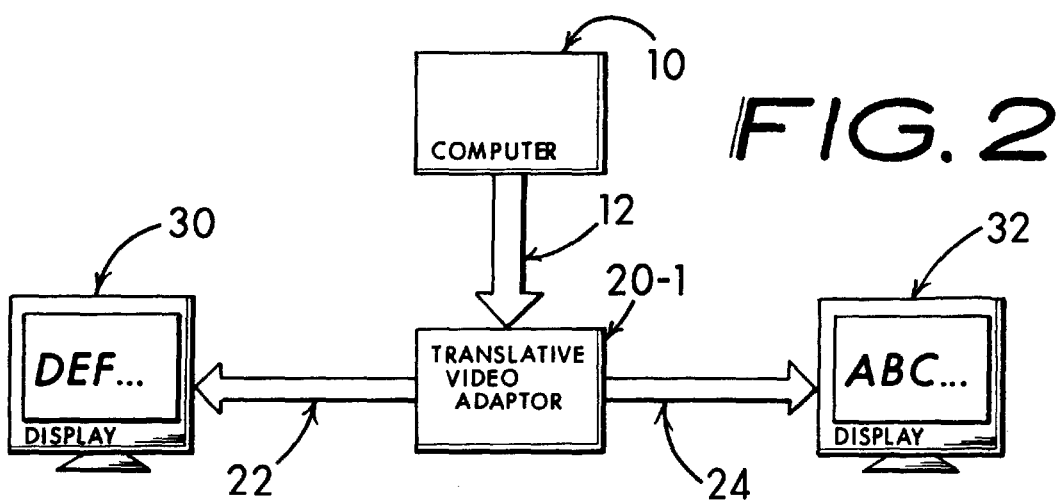
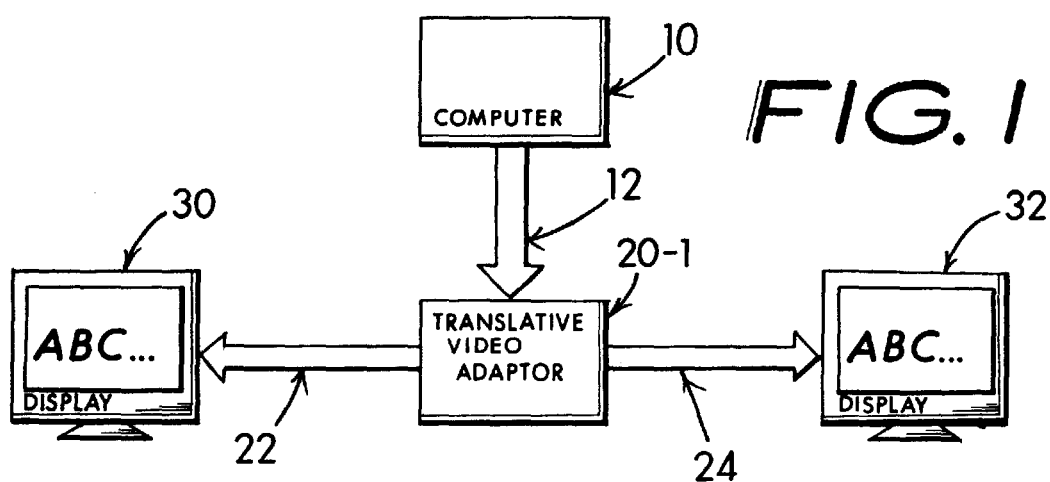
Primary Examiner—Xiao Wu

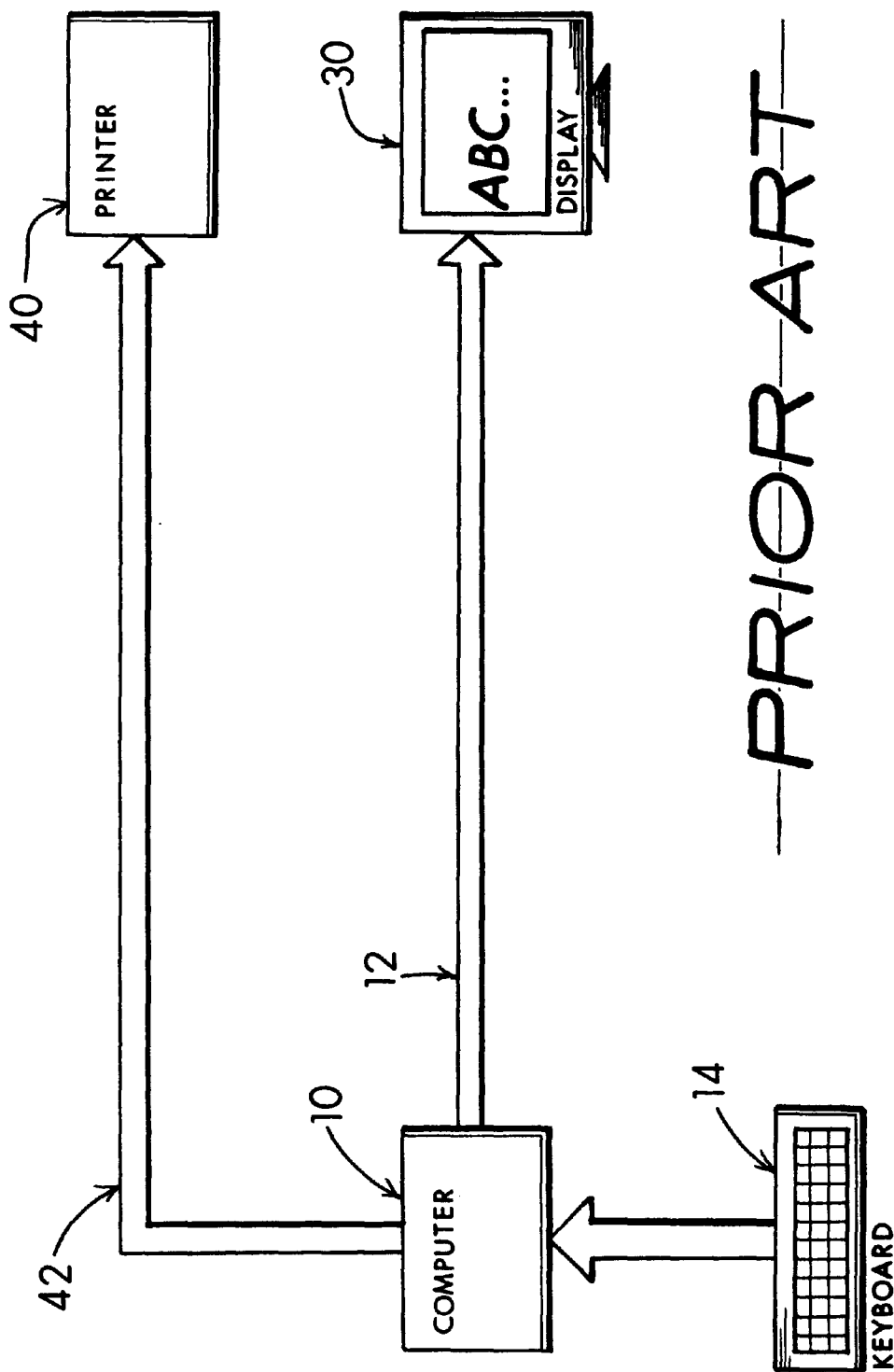
(57) **ABSTRACT**

A computer providing multiple display capability where one display presents the current document and another display may show a true display of a previously opened document. The computer is a singular processed video data signal source which presents a primary monitor with current video data. A user selected video screen sample of the current processed video data signal is diverted to this invention where it is stored in a memory. Subsequently the stored video screen sample of the processed video data signal is read-out of the memory and reconstituted as an absolute copy of the original processed video data signal and concurrently presented on a secondary monitor. User selection may be attained by a keyboard key-sequence entry, a mouse button click or using an external button-switch. Operation is absolutely independent from operating system constraints, being of equivalent usefulness while running any Operating System versions of Windows®, Unix, MS-DOS, Linux, CP/M86 or Apple-OS. The device is preferably configured as a standalone peripheral, having two video ports connected essentially between the computer's "video output" port and the primary monitor's "video input" port and a third video port coupled with the secondary monitor's "video input" port.

20 Claims, 14 Drawing Sheets







PRIOR ART

FIG. 4

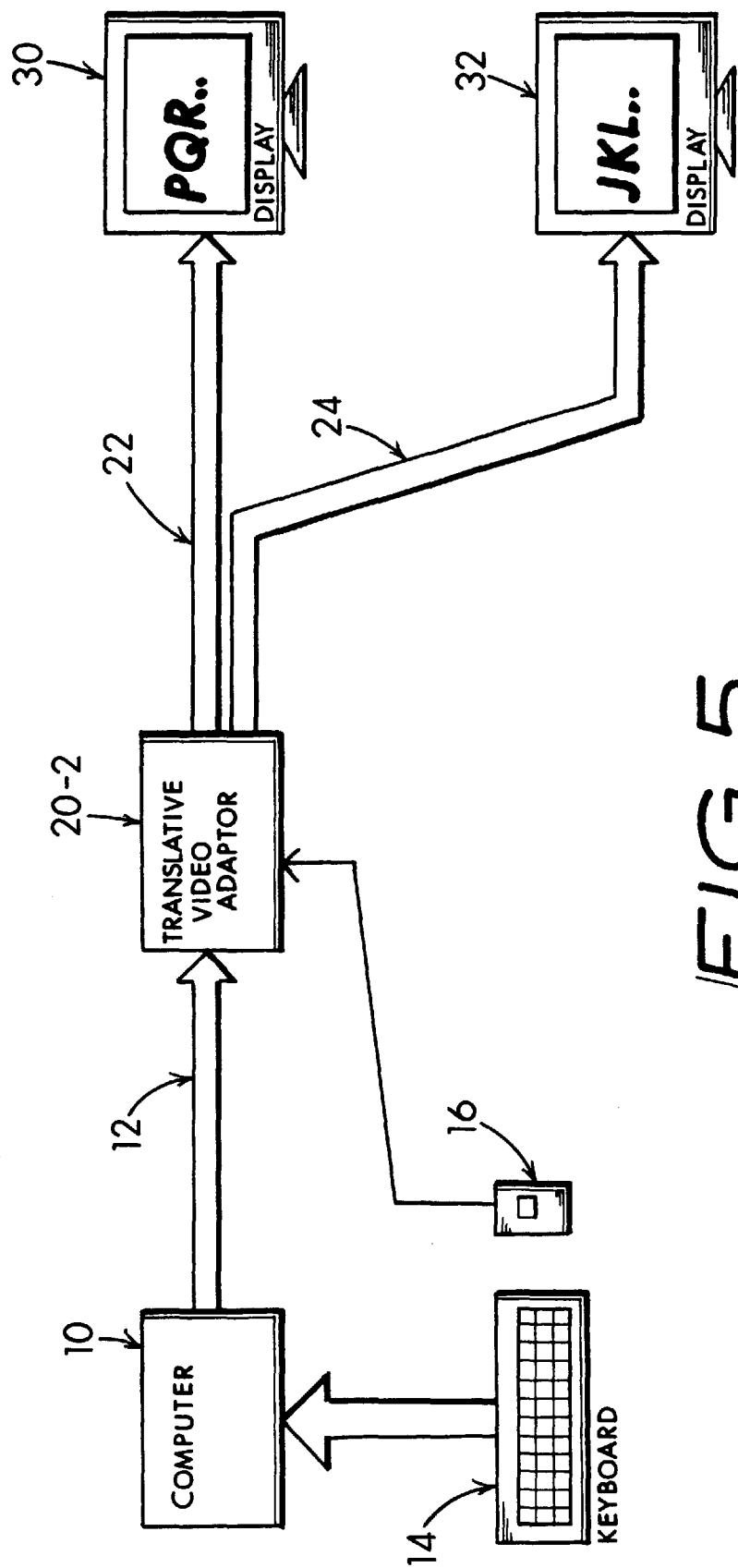


FIG. 5

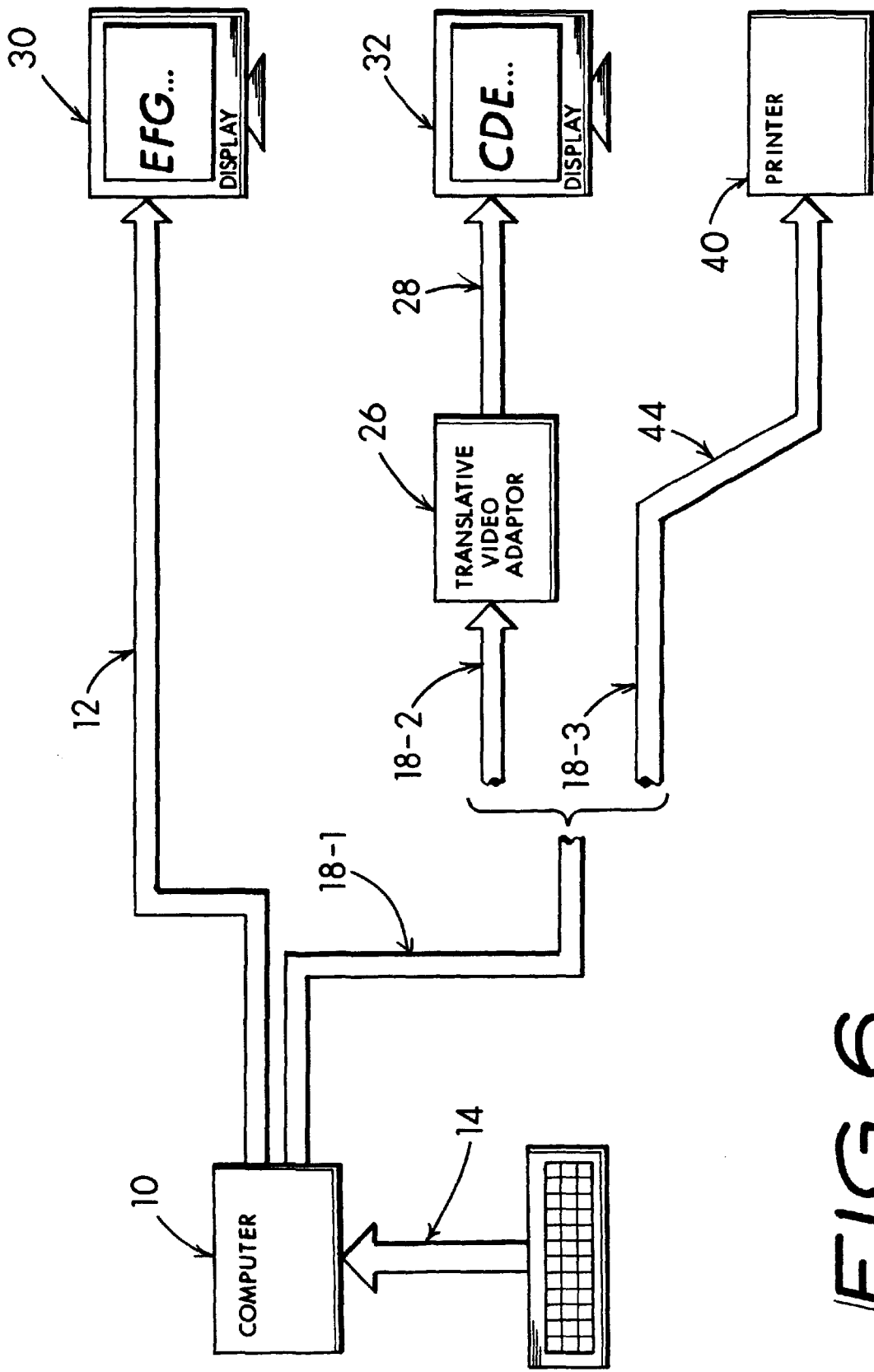


FIG. 6

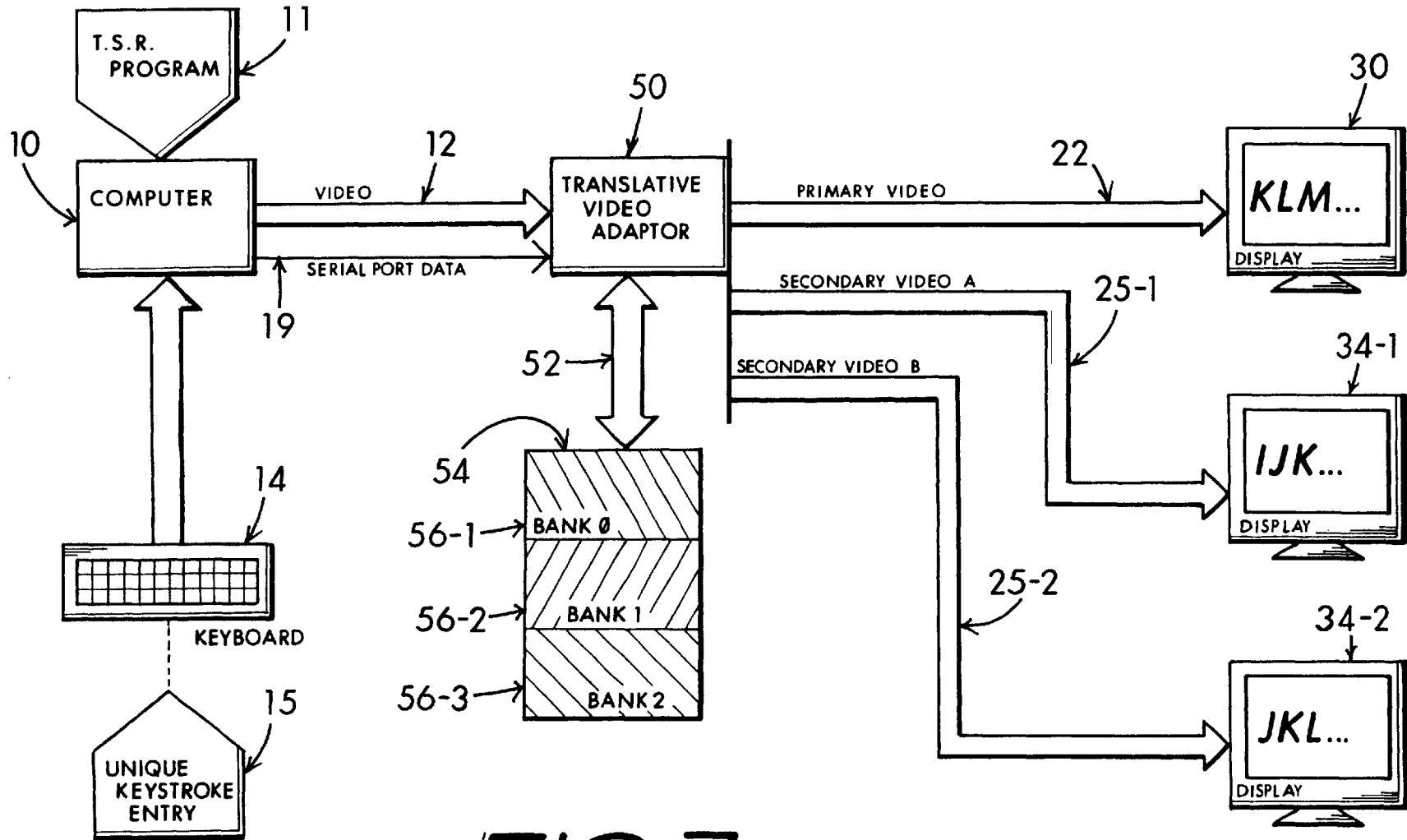


FIG. 7

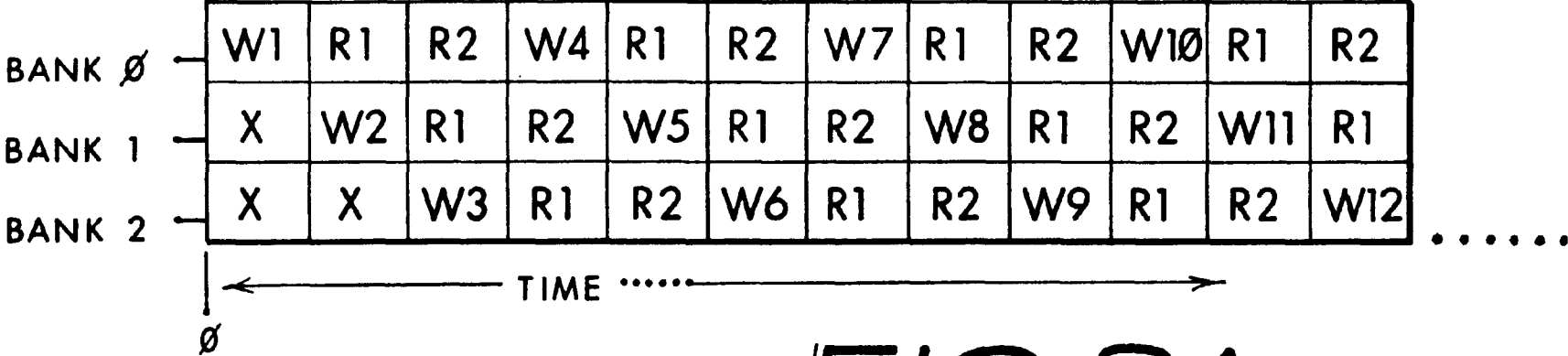


FIG. 8A

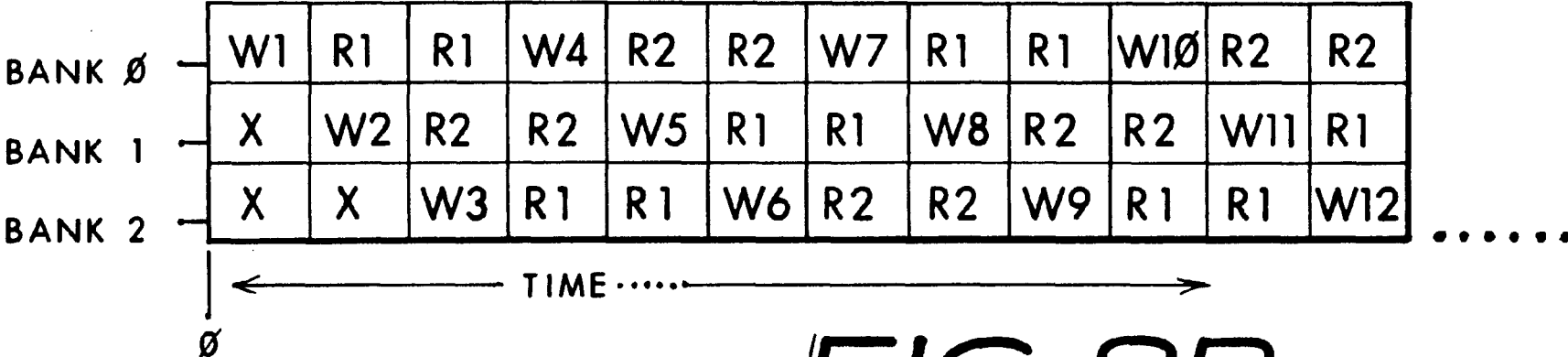


FIG. 8B

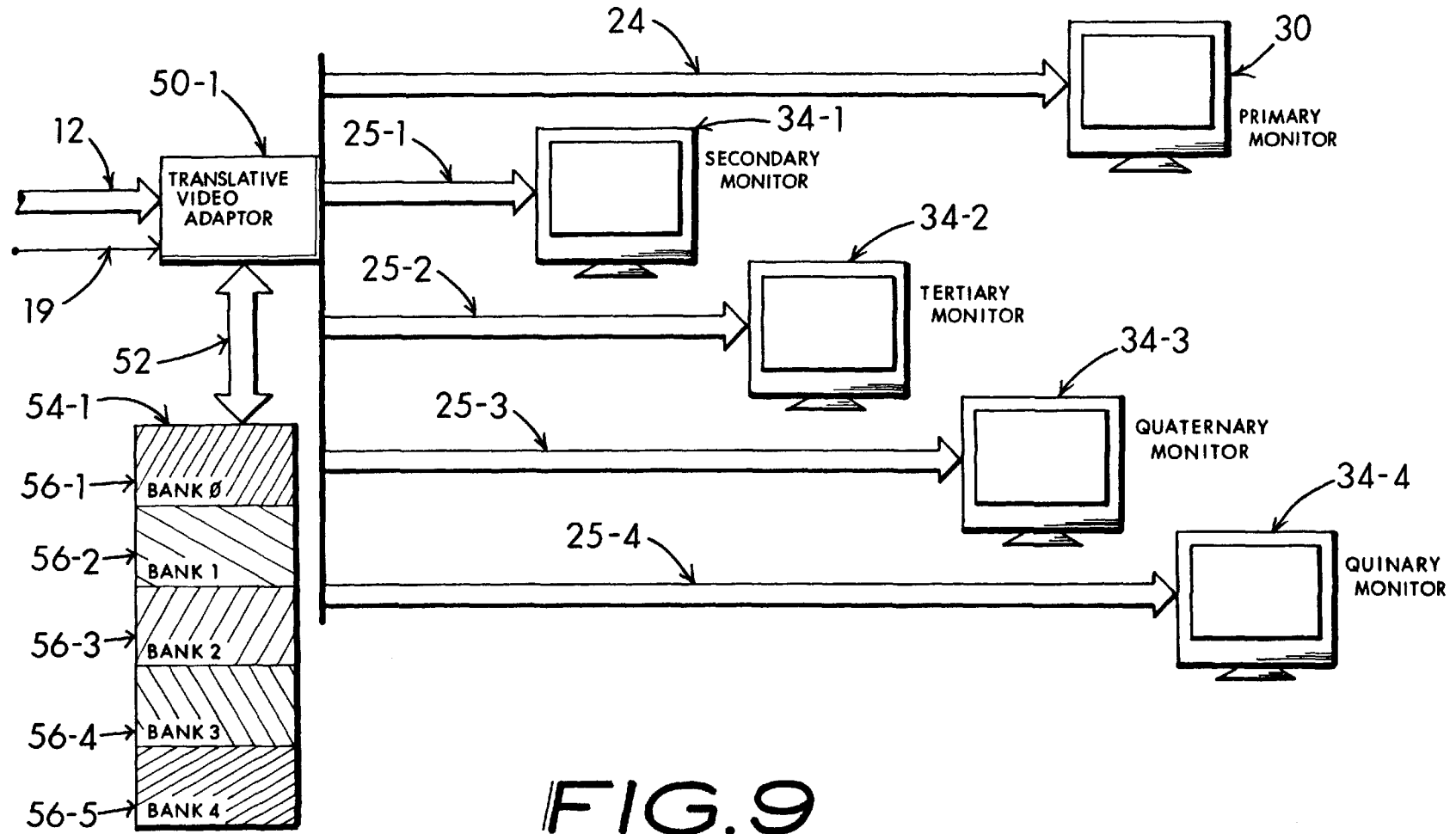


FIG. 9

A56

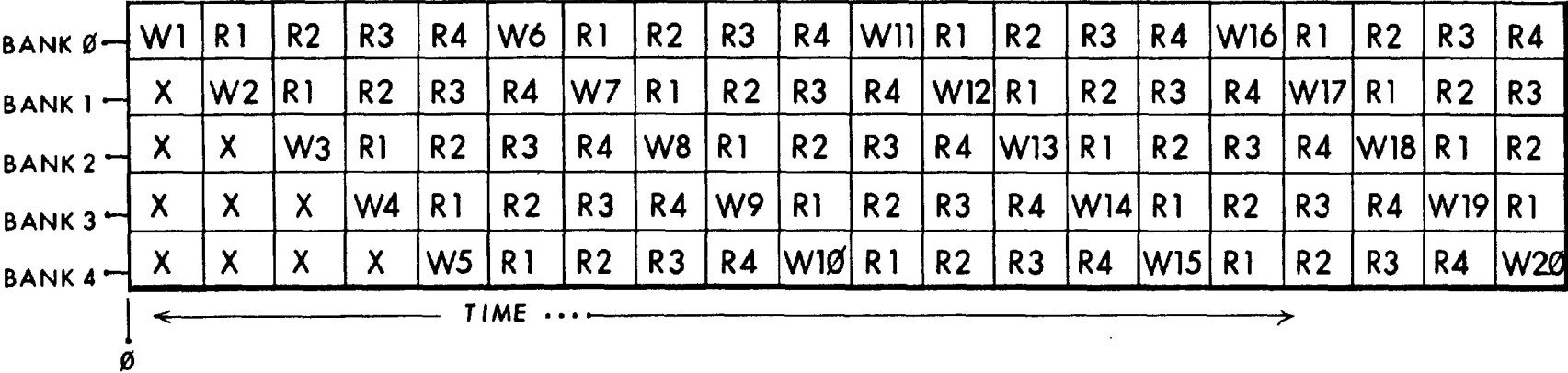
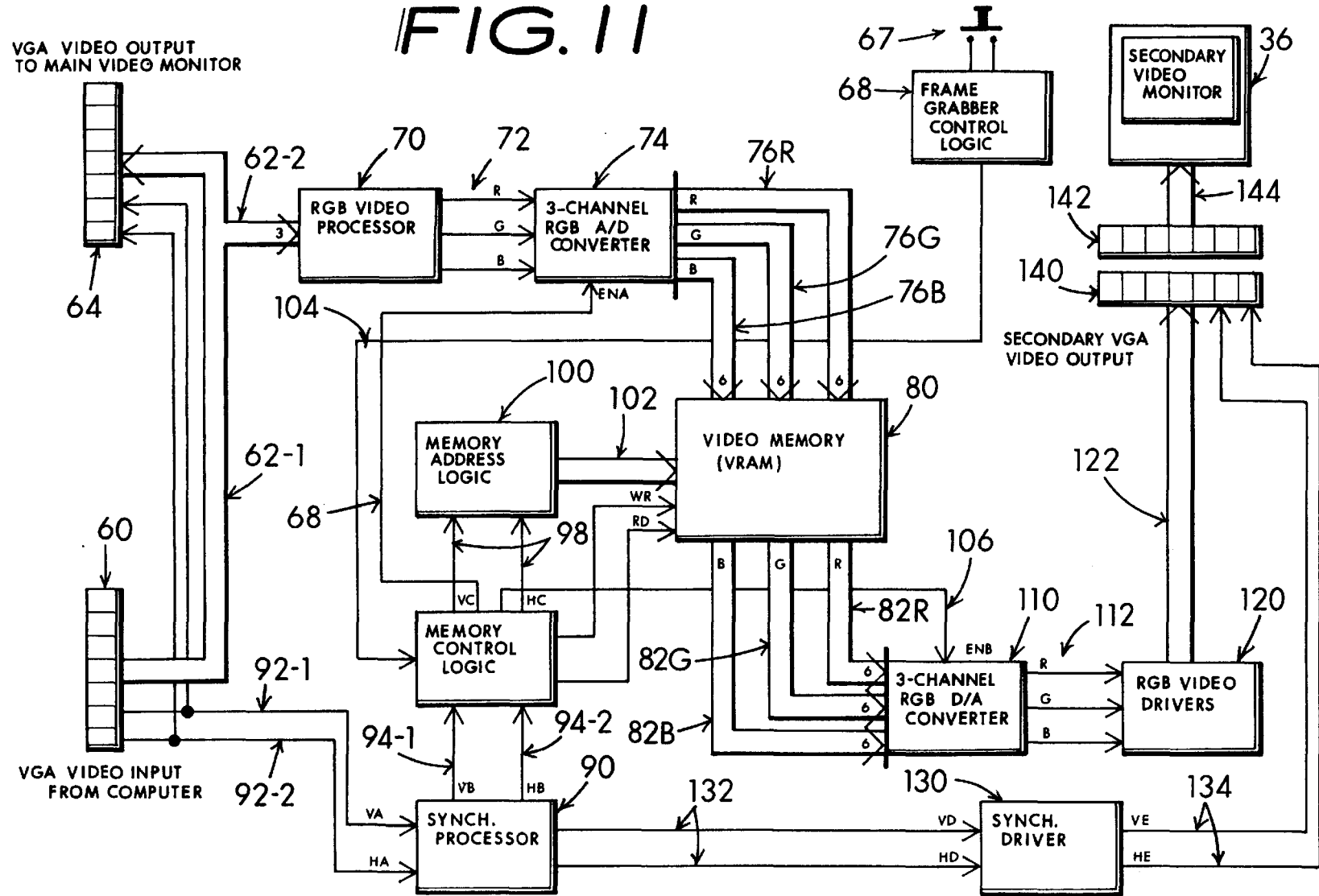


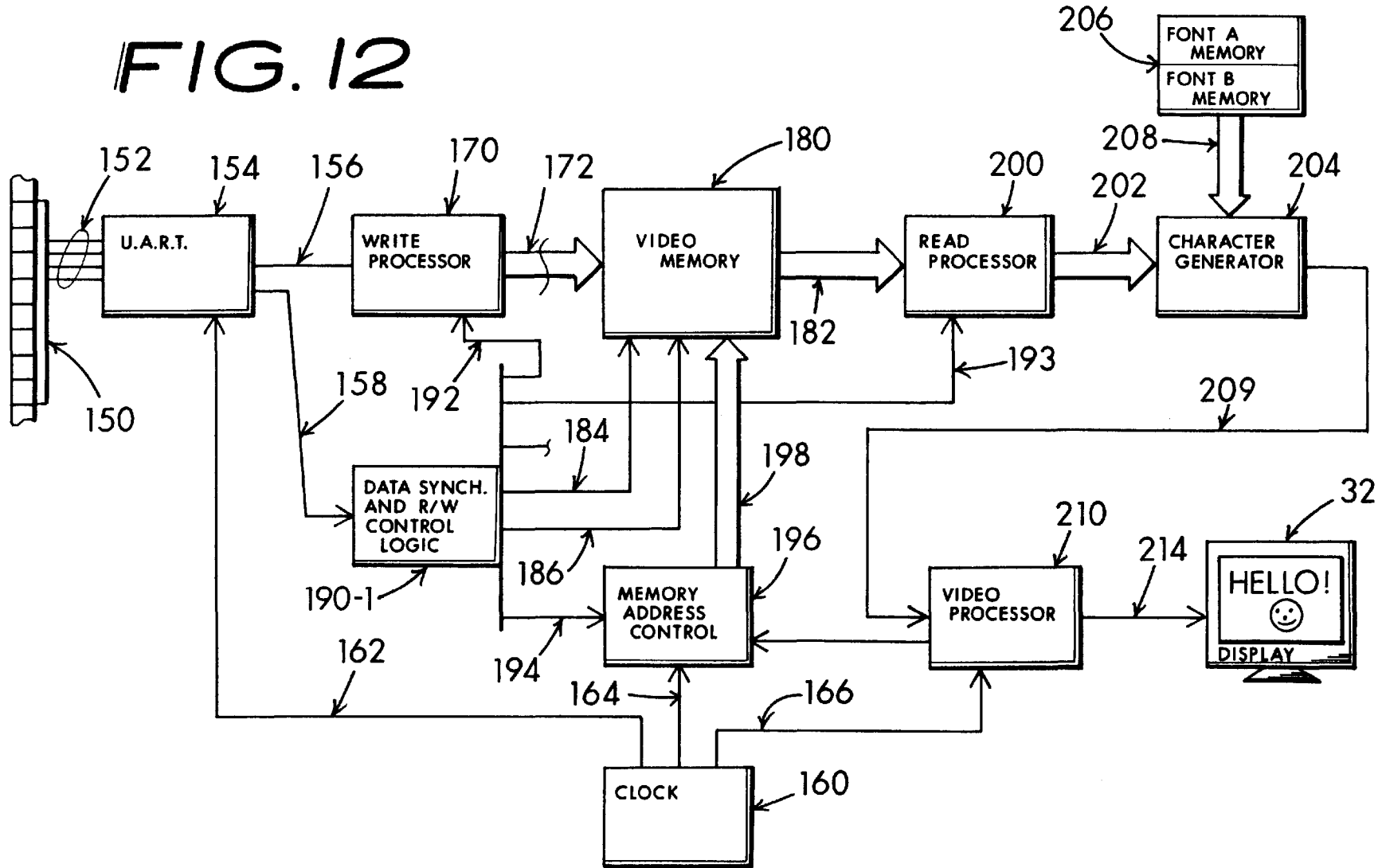
FIG. 10

FIG. 11



A57

FIG. 12



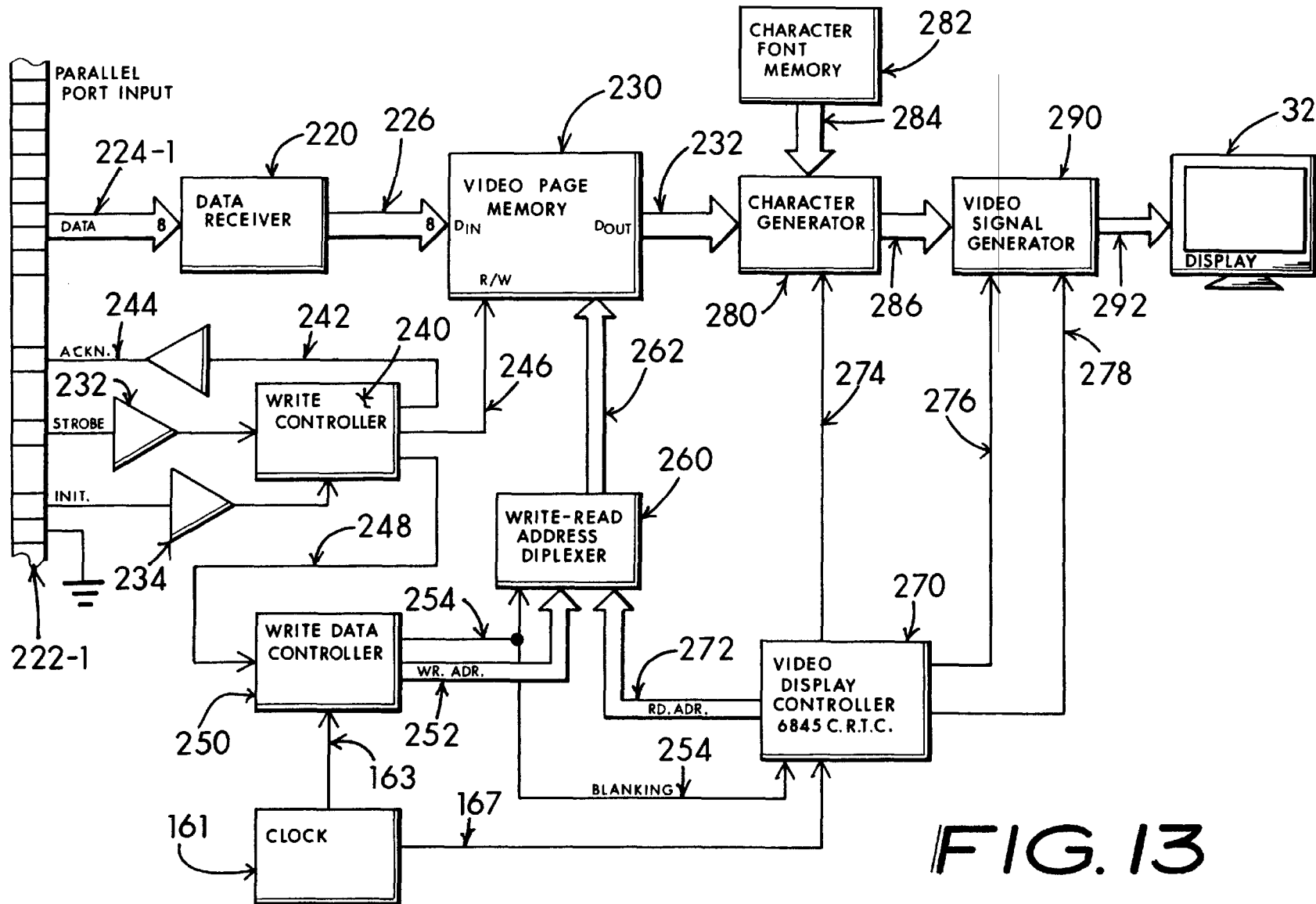
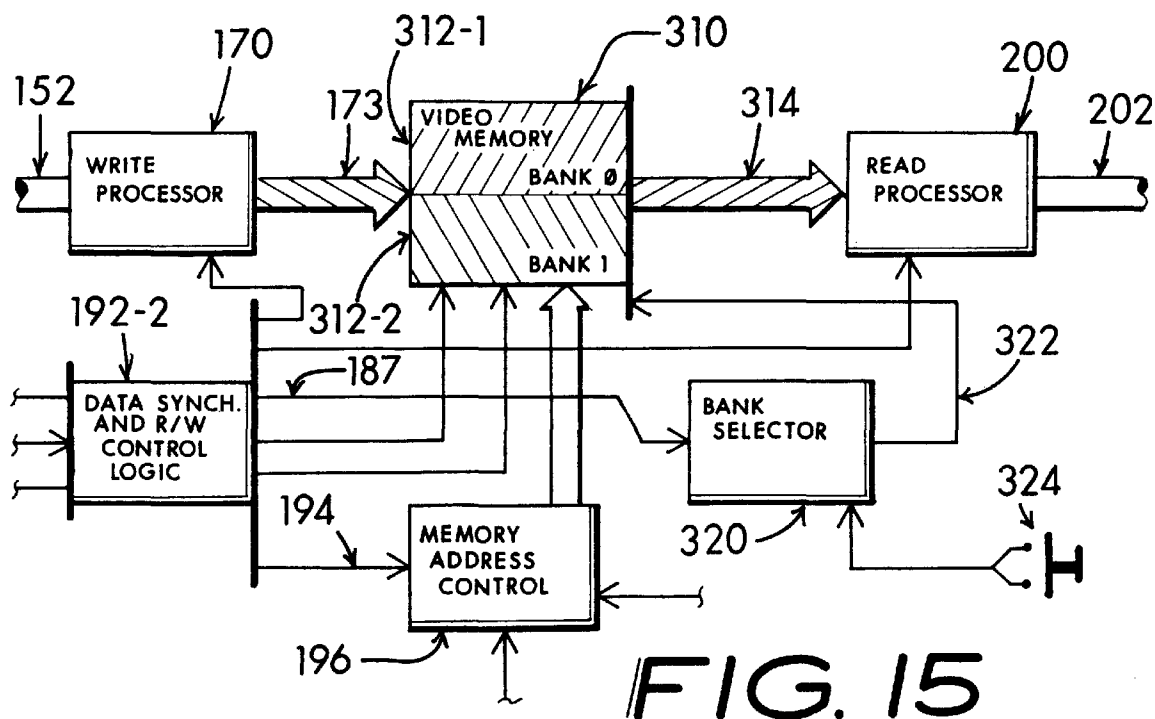
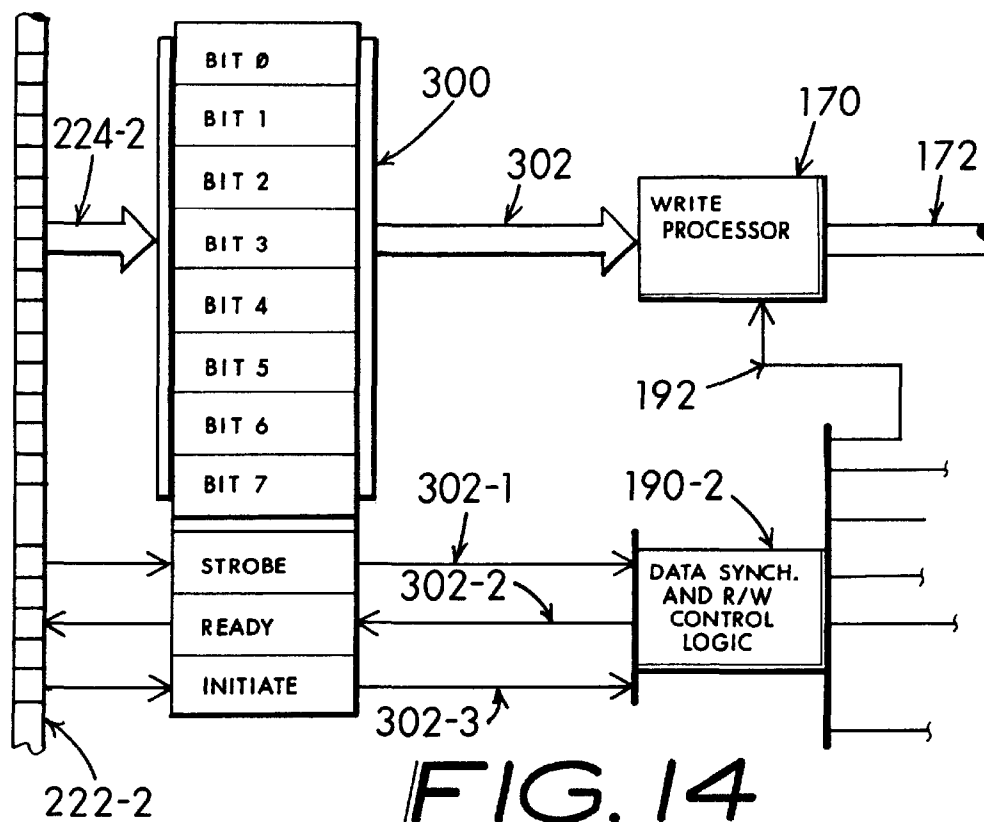
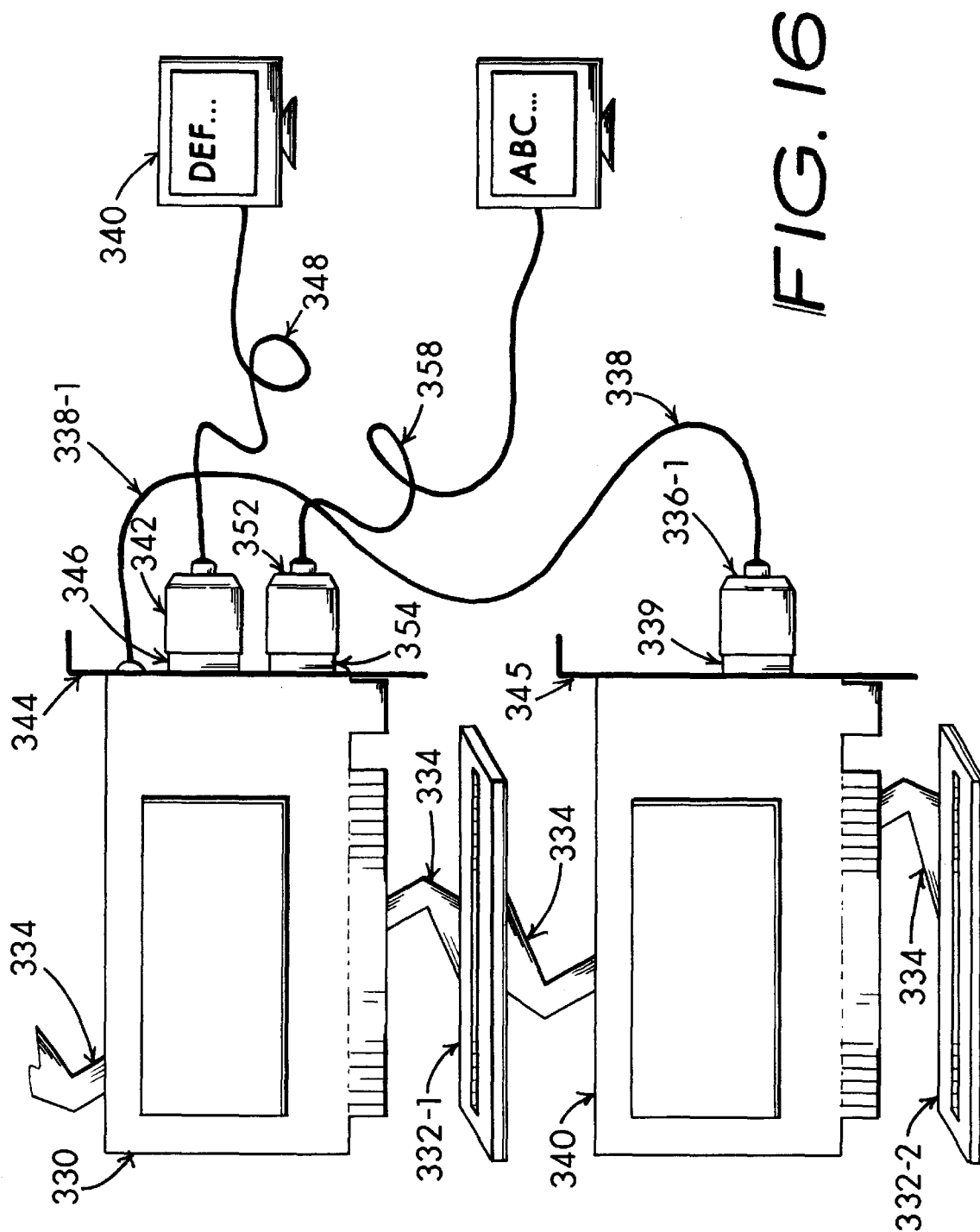


FIG. 13

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A61

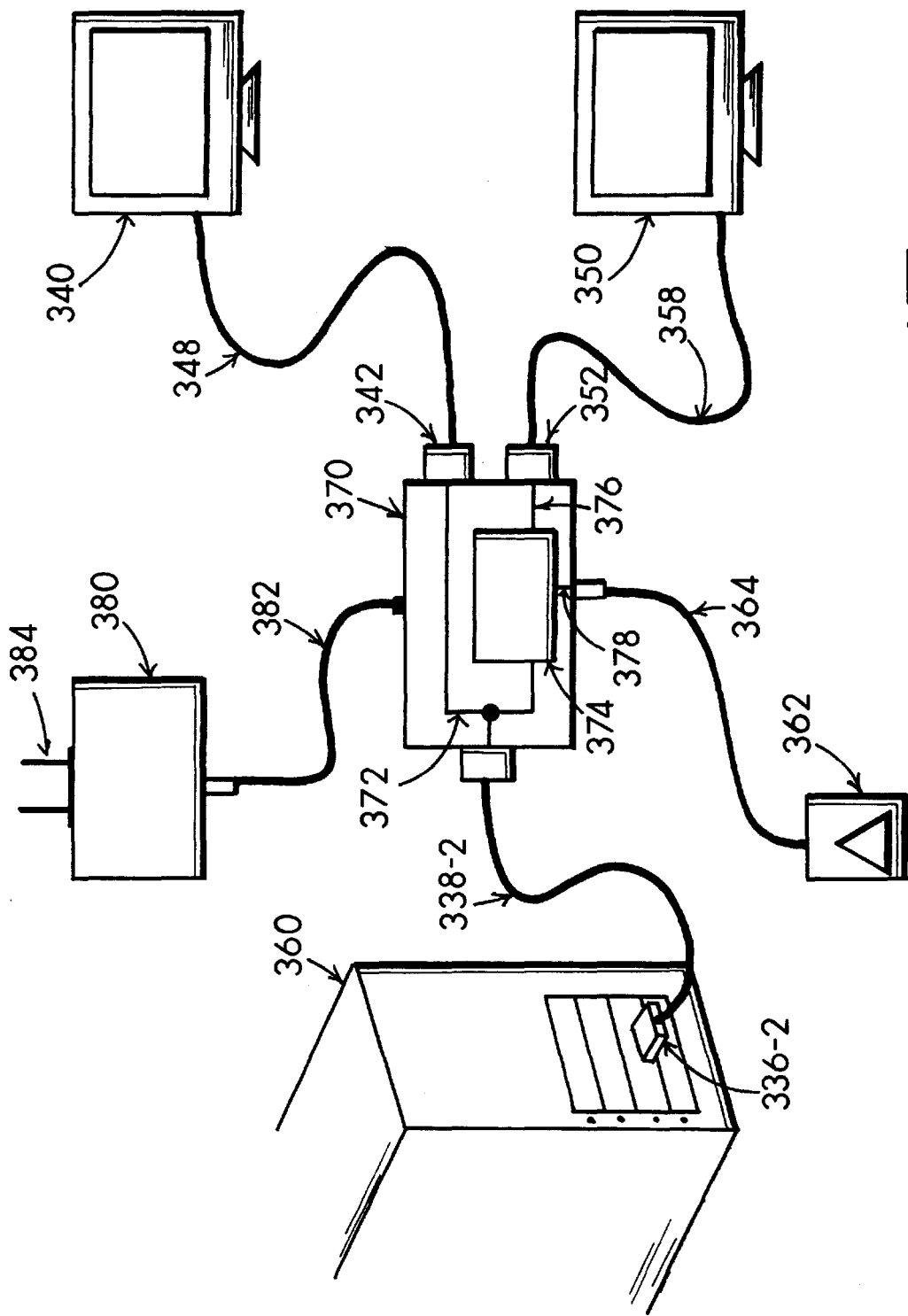


FIG. 17

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**MULTISCREEN PERSONAL COMPUTER
DISPLAY METHOD AND APPARATUS****OVERVIEW**

A computer user working with an application program that produces one or more screens of information may enter a selection of an immediate screen. The processed video data signal delivered by the computer to the primary monitor that relates to the selected screen is concurrently written into a memory. The application program may next advance to display another screen, or another application program. Meanwhile the previously selected screen of processed video signal data is stored in a digital memory and continues to be read-out from the memory and reconstituted as a replication of the processed video data signal selected by the user. This replicated signal is subsequently presented to a secondary monitor for viewing as a predecessor document.

The user may then move ahead to view or edit subsequent portions of the same document or a different document on the primary video monitor. In addition, different software originated windows of information are maximizable and separately displayable on each the primary and secondary video monitors. The device performance stands absolutely independent from operating system constraints. It has been found to be equally valuable for use with programs running under Windows®, MS-DOS, Unix, Linux, CP/M86, OS/2, Apple-OS, Macintosh® and other operating systems where a processed video signal either in graphical or ASCII format is coupled between the computer and a monitor. A current screen data signal is also obtainable through the computer's parallel LPT ports or serial COM ports. A SHIFT+PRINT SCREEN keyboard command is ordinarily submitted through keyboard entry to initiate an export of pertinent video data by way of the computer's printer port. This video data is stored in memory and readout on the secondary video monitor. A primary display video screen selection is made by actuation of an auxiliary key-switch associated with the adapter, by a "third" mouse button entry or by a unique keyboard sequence entry processed by a TSR program to enable the necessary function. Expansion to several secondary video monitors is obtainable through usage of additional memory and control circuitry whereby several preceding document pages or windows of information are simultaneously displayed, enabling more efficient editing or comparison between disparate document portions.

BACKGROUND OF MY INVENTION

Computers are much used in offices and other business settings, as well as for personal use, in preparing documents, writing letters, completing forms and searching data. Computers also find substantial application in desktop publishing of newsletters, brochures and advertising literature. In each of these cited usages, it is often desirable if not absolutely necessary to reference against another document page, or even another class of document. In the earlier text-based computers running MS-DOS, UNIX, etc. it was common practice to "print out" a hard copy of the reference page. This approach was superseded by Windows® software that allowed the layering of two or more related pages. None of these earlier approaches gave a truly concurrent view of a "before" and "current" document. Real time concurrency between two disparate screens has not been practicable, at least not until now.

Windowing OS Application

Common practice in contemporaneous computers is to utilize windowing-capable Operating System "OS" soft-

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ware. Windowing type Graphical User Interfaces "GUI", initially developed by Xerox Corporation and first appearing commercially on early Apple Macintosh® computers provides a user with a near-concurrent view of two or more screens of data/derived from one or more separately running programs. Subsequently the windowing GUI was further developed and more importantly, popularized as a defacto standard of the personal computer industry by Microsoft Corporation. Recognize that Microsoft Windows® appears in one version or another in a vast majority of the worlds desktop, personal and portable computers. A current trend is a rapid increase in the installation of a Linux OS, an open architecture freeware version of Unix, in commercial network and workgroup systems. This suggests that Linux (and Unix) may command a substantial portion of the client workstation applications in the near future. Linux provides a GUI having most of the GUI features of other competitive windowing format OS software. A most popular Linux GUI is "X Window Systems", a freeware program available from Red Hat Software Inc. and others. In addition Corel Corporation supplies "WordPerfect-8" for Linux, which extends the potential for Linux applicability to many more critical usages, such as intranet applications within law firms and the like. A primary advantage afforded by Linux in such critical applications, for example, is the "crash resistance" Linux (or Unix) affords over a typical Microsoft Windows Operating System, while maintaining a goodly degree of compatibility between Microsoft Windows based files and Linux. In contrast, negligible compatibility exists between an Apple OS based applications file and either Microsoft Windows or Linux. Further Linux information may be determined at the Linux website: www.linux.org and the Corel Corporation's website: www.linux.corel.com.

Word processors, spread sheet programs, data base programs and other applications oriented software programs frequently include various windows of related data information which is brought up to full screen size for viewing. These windows are used like a reference, usually viewed in a passive state. That is to say, they are not necessarily subject to immediate editing efforts.

In concurrent application operation, where two or more file editor programs (e.g., word processor, data base, spreadsheet, etc.) are running at the same time, disparate displays are produced which may indirectly relate to one-another via dissemination to the computer's user through a video display and subsequent keyboard entry into an instant program data stream by the user. Letters or other documents stored in more than one word processor or database file are frequently needed to tie together a user's thought process.

Multiple Window Displays

Popular windowing graphical user interface GUI "operating system" software, such as Microsoft Windows® 3.11, Windows98®, Windows2000®, Unix and Linux (and lesser used Apple-Macintosh, iMac® and IBM-OS/2 software), is known to do a heretofore acceptable job of enabling cross-document examination by enabling a user to open one or more additional document windows. This prior art approach is fraught with a major shortfall manifesting itself as an practicable difficulty in providing a user with a quick ease of readability. This objectionable usability factor arises due to a fragmented screen appearance introduced by subwindow layers and an implicit and distracting need for switching back and forth between one or more subwindows typically introduced by the necessitous window partitions situate on the main display screen. As a practical result, the user is frequently "jumping back and forth" between the top window and one or more individual under-layers of sub-

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windows, with an attendant distraction from the central work effort of editing or assembling a principal document's text and associated train of thought.

Microsoft Word® or Corel WordPerfect® running rounder an appropriate version of Microsoft's Windows®, (viz, Windows-3.1,-3.11,-95,-98,-2000,-NT, etc.) as well as Corel WordPerfect® running under a version of Linux (such as Red Hat Linux 5.2) typify this class of wordprocessor editors. An inevitable result of awkward multi-window editing which routinely occurs while using these (and similar) types of programs frequently drives the user to make a print-out of a temporary hard-copy support document. This obvious expedient, while wasteful of time and paper, is also less efficient to use than what an eye-level "on screen" presentation of an immediate predecessor document could provide. The intermediate hardcopy is sometimes produced through expedient use of the SHIFT+PRINT_SCREEN keyboard command now provided on most IBM-type personal computer systems, or through the use of a program's "print" command typically by limiting the printout to the page of immediate interest.

It is in this sort of "comparative" application, where it may be desirable if not necessitous to view a supplementary document while typing-in or editing a primary document, that a "multiple viewing screen" provision may introduce a new level of convenience and operating efficiency into a user's everyday workload. In a practical sense, this translates into a better budget of time, speedier editing actions and general cost savings for any business where the user is an employee.

Windows98 Multiple Monitor Display

Microsoft Windows98® provides the software support necessary to use up to nine monitors. The monitors may be set up like a big desktop, or a different program might run on each monitor. This may enable the use of a wordprocessor on one monitor, a spreadsheet on another and a data base program on yet another monitor. A principal drawback to this approach for multiple monitor operation is that the user must have installed a separate PCI graphics adapter for each monitor. Furthermore, the multiple monitor feature of Windows98® only supports PCI graphics adapters in which the input data signals are raw (unprocessed) video data signals derived from the computer's PCI bus.

The obvious shortfall of this Windows98® based multiple monitor system is inherent in the incapacity for the approach to be used universally with multiple monitors deriving their video signals from other operating systems such as Linux, MS-DOS, Mac-OS, etc. Additionally, this approach works seamlessly only with applications programs that have provisions for the multiple monitor mode, which negates its applicability to a widespread base of pre-existing programs. Nor will this approach work with proprietary operating systems frequently used with commercial applications, such as found in banks and similar non-Microsoft dependent computer systems.

The user will immediately recognize a superiority of this invention's teachings over that of the prior art advanced by Windows98® is the ability to work with virtually any computer and monitor combination, irrespective of the operating system and application program combinations.

Non-Window Operating Systems Displays

Many "professional" software programs used for data management and similar serious business purposes are written in a native language code, i.e. in something like Cobol, Pascal, Fortran, "C", "C++" or any of several other programming languages. Typically, these sort of programs run directly under non-windowing bare-bones operating systems

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such as Microsoft's MS-DOS®, Digital Research's CP/M86, UNIX and LINUX. As is well known, use of these more basic operating systems when run with a well written Assembly language source code or a compiled language such as "C" can lead to far faster and functionally more efficient operational performance with significantly less susceptibility to "crashes" and other annoying malfunctions typical of Windows® dependant programs.

The sheer size of the Windows® operating system files (e.g., several hundred megabytes) and considerable graphical interface oriented data processing makes a more basic operating system preferable when functional speed and operational reliability are of paramount essence. In comparison with the enormous file size requirements, a decent non-windows operating system such as MS-DOS can ordinarily be contained in files of merely a few megabytes in size.

Some custom programs are written with pseudo-windows action (e.g., windows-like functionality not derived from an underlying Windows® or Macintosh operating system). This has been a long known software artform, used in the earliest IBM-PC type computers having basic monochrome graphics capability, such as provided by the then-popular Hercules graphics video adapter.

Notwithstanding these custom programs, it is well known that most non-Windows® oriented programs have little or no windows-like capability, or ability to display more than an immediate screen of information on a monitor. Concurrent operation of disparate programs to provide near simultaneous monitor display is even more exceptional and ordinarily not applicable to conventional non-windows applications programs.

Providing Concurrent Multiscreen Display

My invention now overcomes this deficiency, allowing the concurrent display of an immediate screen of information on the primary monitor and a predecessor screen of information on a secondary monitor, all without benefit of a dependence upon a Windows® or Macintosh® operating system's support. In its most basic operating form, assume you want to view the content of a data file while you type a letter on a word processor. Using this invention, you first open the data file and present it on the primary monitor. When you are satisfied with the screen appearance (e.g., the information you seek is visible), you grab the video signal and store it for readout and replicate display on the secondary monitor. In effect the display becomes "locked onto" the secondary monitor. Next, the word processor is loaded and you view your work document or letter on the primary monitor while you may review data held on the secondary monitor's screen.

Unambiguous Predecessory Display

In iteration, I realized that a far superior method for providing a computer user with serviceable interactive cross-file editing is attained if the predecessor reference or support document data display is supplied near eye-level as an unambiguous presentation on the secondary video monitor. Meanwhile the primary monitor is used solely for display of the main, or working, document data.

Sneaker Networking

In a primitive form, this dual document display arrangement is sometimes clumsily implemented through a "sneaker network" approach, wherein the immediate data file is manually transferred from "computer A" and carried over to "computer B" by using a floppy-disk, ZIP-Disk®, or the like which is used to temporarily hold data and allow an operator to manually transfer the data into a separate computer system where it might be separately displayed adjacent

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with the primary display as predecessor data. This is a long-used approach and its limitations and convenience shortfalls are well known, not the least of which is the requirement for a wholly separate and necessarily similar second computer system which is loaded with and running (a separate copy of) a similar application software program in order to effect a generally useful presentation of the reference document data file. In this prior art arrangement, the main computer is used for a principle editing or data entry function, while the second computer serves merely to display contents of the reference document.

Local Area Workgroup Networking

In another setup, the data being displayed on the main computer might be networked or ported to the second computer for supplementary display. In a configuration emulating my invention, this setup is treated like a "one-person workgroup". In other words, the same operator is using two or more computers in the same network, viewing the "previous" and "present" data on separate monitor screens. Networking data does require special and costly network adapter hardware and suitable network software support, which necessitates more advanced user skills. For example, each computer in such a peer network (even if used on the same desk by the same person) must be equipped with an EtherNet LAN 10Base-2, 10Base-T or IEEE 802.3 compliant adapter card, i.e., a Boca Research Inc. "BOCALAN-card" or equivalent, and suitable operating software, such as Microsoft Windows for Workgroups, Windows-NT, Windows-98, UNIX, Linux, Novell NetWare and other NDIS and ODI compliant systems. If the network ported data is stored in the slave computer, then predecessor readout may be simulated whereby the display on the master computer may advance ahead of the slave computer. Herewithin, predecessor refers to a historical store or supplementary display of video data which are succeeded or replaced by a subsequent updated or alternate main display. While either of these arrangements can be effective, they each involve substantial hardware duplicity and inherent expense in form of a functionally similar but fully separate computer system hardware, software and related maintenance. Furthermore, a time-consuming necessity for loading or networking a database or program copy containing the reference document data into the second computer system demands time consuming operator training and additional user effort and experience level.

Simple User Interface

These prior approaches obviously do not imitate the essential eloquence of my translative video adaptor (hereinafter TVA or "the adaptor") invention. In these inferior heretofore configurations a considerable interactive manipulation of both computers is necessary to merely emulate the antecedent or predecessor display of an previously viewed screen of data on the slave computer's monitor.

As a result of these shortcomings of the prior art, my TVA stands alone as unique and not merely an obvious extension of the cumbersome and inefficient prior art that heretofore merely utilizes one variation or another of local area networking.

To be truly useful and efficient, the user ought to be able to display a predecessor, reference document with a minimum of time consuming effort, prior skill and requiring a minimal amount of "learning curve" effort in order to get meaningful results. The predecessor display ought to be presentable on a second monitor in a manner which is functionally transparent and operationally unassuming to the average user. In other words, aside from a simple

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keystroke command or "click" entry via a control device such as a mouse button, the user effort needed for updating of screen data on the second monitor ought to occur without distracting the user from a thought train that may better be focused on the principal document task.

TVA Supports a Slave Monitor

I find that a more efficient and economical form of cross-document data file referencing is readily obtainable by using a secondary display monitor which is uniquely coupled as a slave to a stored video signal provided by my TVA invention and sampled directly from the computer system's primary display monitor's fully processed video data stream, as opposed to obtaining the raw video data signal from the computer's internal data bus signals. In other words, the processed video data is preferably fully conditioned and formatted as "monitor video signal input ready".

External TVA Interface

A paramount advantage of my invention over known prior art is the intrinsic capability for it to be engineered in variant forms which works equally well with virtually any operating system and in any computer hardware configuration albeit standard or oddball in arrangement. My invention supports all common video formats through appropriate design of the hardware details, including color VGA, EGA, SVGA, CGA, etc. It works well with either monochrome graphics such as Hercules graphics or strictly ASCII-text based displays. Additionally, it is reasonable to design my invention so that a shared unit may be usable with several different video formats.

A preferred embodiment for my invention is as a standalone accessory device that simply plugs in series with the video cabling. In other words, a short video "jumper" cable may connect between the computer's video output connector (usually a DB9 or DB15 form) and an input to my TVA device. The primary monitor and the secondary monitor then each plug into appropriate mating connectors outputted from my TVA device. A foremost advantage of this preferred embodiment of a standalone TVA device is that it can be provided as an independently functional standalone accessory having a form factor about the size of a large cigarette pack that can be hooked-up using a minimum of skill, usually foregoing the usual need for obtaining costly shop service to "install something", such as an adapter card into one of a PC's available "slots".

TVA Stores Full Video Screen Frame

My TVA typically includes sufficient video memory space to ordinarily store at least one full screen of monitor-ready processed video data which are used to produce a separate and usually antecedent video data stream for writing a predecessor image screen on the second display monitor. I also find that grabbing a screen (or frame) of video information is conveniently accomplished through an expedient of providing the user with a separate control button (maybe a third "mouse" button) which is manually actuated to initiate the immediate grabbing of the video frame representing the screenful of video data of interest.

Software Operated Predecessory Image Transfer

I also find that the initiation of a frame-grab event may be convenient when it is software implementable, particularly when the TVA is an external device. The frame grab may initiate through a response by a TSR routine singularly responsive to a unique keystroke combination that initiates a "grab signal" output through the computer's serial port. In practice the TVA is serially coupled with the primary monitor's processed video line and provides a replicate processed video signal to a secondary monitor. Additionally, the TVA is coupled with the RS232C serial output port (usually

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COM1 or COM2 or equivalent) or a Universal Serial Bus USB port. The grab signal is thus delivered through the serial port and initiates the screen data storage command for the TVA memory to provide predecessor video data for the secondary monitor.

Internal TVA Functions Like "External" TVA

The TVA may be configured so as to allow it to be internally installed as a plug-in circuit card in one of the computer's expansion bus slots. An internally installed TVA is distinctly different in conceptual approach from merely being equivalent to and performing like a second video card, as suggested in the past by Microsoft and others. This distinction is implicit in that the TVA essentially taps-into and accepts a sample of display-ready processed video which ordinarily routes from the computer's usual video processor circuitry directly to the primary video monitor for immediate presentation. In other words, in the usual computer configuration the video tap is made external to the computer hardware, usually via a cable jumper between the TVA and the usual video processor card's output connector.

In this arrangement of my invention, the primary monitor and the secondary monitor each plug-into separate connectors usually sited on the TVA card's mounting plate. In this arrangement, a control signal might be obtained directly from the internal card bus as submitted by the TSR software routine. Alternatively, an external "grab switch" may be connected with the TVA card to permit absolute user controlled manual screen data grab initiation.

A most fundamental intent for my TVA is to avoid a variety of predecessor display errors which a plurality of separate "video adapter" cards operating from raw bus signals may introduce.

Real-Time Processed Video is Utilized

It is urgent to realize and bears repeating that my invention, whether internally mounted as a plugin card or externally located, strictly samples the real-time, processed and monitor-ready video data signal ordinarily delivered from the output of the video adapter card. My TVA stores a true "what you see" frame sample for subsequent "what you get" display on a secondary monitor as an accurate replica of a predecessor image that has been recently displayed on the primary monitor. In other words, the INPUT to my TVA device is derived directly from the OUTPUT of the computer's usual video adapter card as monitor-ready processed video signals.

The physical interface is most often embodied as a short jumper cord extending between the video output and my TVA input. As a result of this operational distinction unique to my invention my TVA must not be misinterpreted as merely "just another form of video card".

With the internally located TVA a transient-stay-resident (henceforward TSR) subroutine program may conveniently serve to implement video frame grabbing in unique response to certain predeterminable patterns of keystroke sequence entries, such as ALT+SHIFT+PRINT_SCREEN, for example. Although a TSR triggered instruction obtained from the computer's control bus is utilized to trigger my invention into action it remains to be absolutely understood that it is the post-processed video signal which is grabbed, sampled and temporarily stored. By definition my invention obtains this post-processed video signal ordinarily from the output of the computer's usual "video card". In contemporaneous computers, this video signal is ordinarily in VGA, SVGA or EGA format or an equivalent technical variation or operational extension and including monochrome graphics or ASCII character based displays.

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Separate Computers Compound Video Errors

Additional discrepancies wrought by the prior art methodologies using separate computers may occur as a result of even minor system set-up differences, or due to fundamental variations in image processing technique, particularly between video cards of different brands and models, or of even the same brand picked from different production lots where the video processing algorithm may be slightly changed.

Emulate Hardcopy Printout as Display

Instead of obtaining the video data signal from the video signal port as the predecessor screen signal, the TVA may alternatively couple with the computer's PARALLEL printer port LPT1 or SERIAL RS-232C port COM1, or a Universal Serial Bus USB connection. In this usage, a SHIFT+PRINT_SCREEN keyboard instruction urges a current screen data stream to be processed so as to flow forth to the parallel (or serial) port. As with tapping into the video adapter's output, this provides an equivalent screen of data which is subsequently stored in an ancillary video memory portion of the TVA. In a "graphics mode" a printer signal delivered in this hookup is quite similar to the primary monitor's video signal and for practical purposes may be considered equivalent. In a standard ASCII screen presentation (e.g. a typical 80 column, 24 or 25 row alphanumeric screen of data) the characters flow forth from the printer port and may be subsequently stored in my TVA's memory.

The printer port data stored in the TVA memory is subsequently read out and reconstituted in a video format suitable for scanning the monitor screen display. The major difference in this approach is that a "WYSWYG" graphics or ASCII alphanumeric printer signal output is relatively slow compared with the video signal format. In effect, this means the screenful of printer data is read-into the TVA memory rather slowly, while its monitor-ready video signal is read-out very much faster. This is merely an engineering consideration that leaves the essence of my invention's objects unscathed.

Albeit a substantial compromise in video format, this variant approach for practicing the essence of my invention is comparable in usefulness to initiating a SHIFT+PRINT_SCREEN directive to send data to a hard-copy printer. In my invention's practice the information "prints" instead to my invention's TVA and is retained in the TVA memory and subsequently read-out onto the screen of the second display monitor.

Utilizing the printer-equivalent output for my TVA's video source does provide the computer user with a preview of what a hard-copy printout might look like. As a result, editing of layout and other factors may be exercised prior to "wasting" an actual hard copy printout.

Remarkable Use with Individual Workstation

Workstations, or individual computer systems, which are networked in an intranet with a central server that ordinarily holds many files in a common data storage facility may substantially benefit from my invention's application. It is frequently beneficial for a network user to have an ability to uniquely display and hold an individual frame of data on a separate slave type video monitor for more convenient reference, comparison or editing purposes. In other words, a user of a workstation tied into a network can divert the workstation video to my invention's TVA and subsequently view a predecessor workstation screen on a secondary monitor.

A keynote advantage of this usage of my invention with a typical workstation is that aside from providing the user with a reference display of a document on the secondary

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monitor, it accomplishes this goal without tying up network resources. This network oriented, shared database use of my TVA and a separate monitor screen is a fundamental characteristic of my invention that is just as important for the workstation user as it is with an individual user of a stand-alone personal computer.

FIELD OF MY INVENTION

My invention pertains to computer systems which display information on video monitors and most particularly to personal computers, personal office computers and individual workstations, including those which are networked with a server or mainframe. I tend to focus this invention's teaching towards IBM-compatible computers and workstations typically using Intel, AMD or Cyrix architecture microprocessors merely because this is unequivocally the most popular and widely used PC hardware at the time of my invention. My invention is equally applicable to other less popular systems, including the Apple Macintosh® and iMac® which, while being little more than a niche computer having a relatively tiny installed market share, can clearly benefit from multiple-display service for better user convenience.

Various Operating Systems

More importantly my invention applies to a plethora of operating systems including various versions of Microsoft Windows®, Apple-OS and IBM OS/2. It also applies to non-windows system programs such as UNIX, LINUX, CP/M86, MS-DOS, Sun-OS and a variety of other proprietary operating systems.

The underlying intent of my TVA invention is to intentionally redisplay a predecessor screen of video derived from a processed video line ordinarily coupled between a computer and a monitor. The TVA device works equally well with and affords about the same operational benefit to both windows and non-windows applications programs.

SUMMARY

Secondary Monitor for Predecessory Display

A secondary video display monitor of ordinary design is typically used in conjunction with my Translative Video Adaptor (TVA) to grab and indefinitely store individual selected frames of data ordinarily delivered to the usual computer's main monitor. In other words, it is the TVA device alone which supports the essence of my invention and the applicable to secondary monitor may be universally picked from an array of screen sizes and features as provided by any number of makers. The stored data are subsequently read-out and displayed on the secondary (i.e., supplementary or satellite) monitor to serve to display full screens of pre-occurring reference information which enables a user to conveniently evaluate or edit other usually immediate program data which are subsequently displayed on the computer's main (i.e., primary or first) display monitor.

Translative Video Adapter

I have coined the term Translative Video Adapter (TVA) to succinctly phrase it's technical performance. In effect, my TVA accepts the processed video signal from the computer, firstly translates the video signal into a binary format for digital memory storage. The digital memory is subsequently read-out and the retrieved binary format data is then secondly translated back into a reconstructed processed video signal format that serves to drive the secondary, or antecedent display monitor and closely replicate the predecessor screen of data.

A TVA Card is Not a Video Card

As an adjunct to a computer utilizing a VGA (video graphics array) or equivalent display, my TVA may be

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conveniently built upon a plug-in printed circuit assembly which is temporarily inserted into one of the available expansion bus slots ordinarily associated with a typical personal computer (including Compaq, Packard-Bell, Acer, Dell, AST-Research, Gateway, and Hewlett-Packard PC clones based upon or compatible with an original IBM-PC, IBM-AT or IBM-PS/2 design). In an unequivocal distinction between my TVA and prior "video adapter cards", I preferably interface the processed video signal directly.

A jumper cable may couple directly between my TVA card video input and the computer's usual VGA type of video display card's analog video output terminal. The jumper cable serves to convey analog RGB (red-green-blue) processed video signal levels from the video display card's usual output directly to my TVA card's input. In this arrangement a principal advantage resides in the ability to obtain necessitous operating power levels directly from the internal expansion bus connector.

The original or principal VGA video monitor is subsequently plugged into a connector provided on my TVA card. A separate sample of each of the analog R,G and B video signals is grabbed by an input of each of three high speed video ADC (A/D converters). The digital output from the ADC is then coupled with a video memory bank which is appropriately sized to hold the necessary video data bytes for supporting at least one full video frame. The memory is repeatedly read out to three video speed DAC (D/A converters) which return the video signal back to its analog RGB signal format for application to the secondary VGA video display monitor.

TSR Routine Enables Predecessory Frame Grab

Video frame grabbing can be initiated by the user through a unique keystroke sequence (say, ALT+SHIFT+PRINT_SCREEN) producing an unique PC keyboard scan code sequence (i.e., 38+2A+E0_2A E0_37 and hereinafter called Alt_Shft_PScr) manually entered via keyboard and coupled through the computer's main data bus. A TSR (transient stay resident) software subprogram compatible with the installed operating system is ordinarily utilized to act on the selected keystroke recognition. The TSR instructions may be transparently setup in the computer's high memory through installation of a suitable code line in the computer's usual AUTOEXEC.BAT or equivalent batch file.

My TVA device, when embodied as the mentioned to plug-in card, may be particularly convenient when the computer is intended to service CGA (color graphics adapter), EGA (extended graphics adapter), MGA, (monochrome graphics adapter, such as Hercules), or even ASCII-based MDA (monochrome display adapter) dependent display monitors. These earlier types of monitors continue to find substantial, albeit dwindling commercial usage, particularly for database, data entry, programming code preparation and basic word processing applications.

Faithful Rendition of Predecessory Screen Display

The eloquence of my invention is that a faithful duplication of whatever video processing the computer's usual built-in video circuitry provides is absolutely duplicated so as to precisely replicate the primary display presentation on the secondary display monitor. Ordinarily, a frame of video is grabbed and stored in my adaptor's video memory in response to instructions received from a software TSR routine in recognized response to a unique keystroke sequence such as the mentioned Alt_Shft_PScr (example) routine. Otherwise, in absence of software provision, the TVA may be triggered to grab a frame of video signal ordinarily routed to the principal monitor in response to actuation of a portable keybutton-switch, additional mouse-

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button, or the like usually located near or includable as part of the user's keyboard. The memory stored signal is then continually read-out and buffered to suitable video signal levels and fed to the secondary display monitor where it is accurately rendered for content, color and shading. This provides a true image for the operational convenience of the user.

External TVA Device is Flexible

An external TVA may be provided which intermediately couples between the computer's usual VGA video adapter's DB-15 video OUTPUT receptacle and the VGA or SVGA video display monitor signal line plug. In this preferable arrangement, the video signal coupled with the TVA is ordinarily in analog format and suitable A/D (analog to digital) conversion is performed. A video memory stores data sufficient for at least one complete video frame. At a minimum a 640x480 pixel frame may require about 692 kilobytes of memory to support 256 colors, while a 1024x768 pixel frame may require at least 5.3 megabytes or so of storage for the same extent of color resolution. The stored memory output data are subsequently utilized with a D/A (digital to analog) converter to reconstruct the analog video signal for immediate coupling with a separate secondary video display monitor. In this arrangement, a separate manual "update" key-switch convenient to the operator may be actuated to grab a new frame for storage and display on the secondary monitor. Conversely, a connection between the TVA and a serial COM port might be utilized together with a TSR software routine to obtain operation from a unique keyboard entry combination, such as the mentioned Alt_Shift_PScr routine which encourages a frame grab trigger signal to deliver from the COM port.

Asimilar external adaptor may also be readily designed to couple with the TTL signal level video monitor output lines provided on many earlier personal computers. Since the usual video signals are inherently binary in these earlier display monitors, they do not require A/D conversion but rather can obviously be engineered to couple directly with the memory. The output of the memory is then read-out and further conditioned back to a TTL level appropriate for application to the secondary TTL level video display monitor. A separate key-switch located near the operator, or an additional mouse-button may be actuated to grab a new video frame or screen for storage and display on the secondary, monitor. Alternatively, a control signal connection between the TVA and an output port such as the usual serial COM port or USB port might be established together with a software TSR routine to establish operation from a unique keyboard entry sequence, such as the said Alt_Shift_PScr routine.

Character Based Monochrome Display

Some widely used computer applications utilize straight ASCII-character based monochrome displays. Each character is usually 1 byte, and a typical 80 column, 25 line display produces a maximum of 2,000 characters per screen, necessitating temporal TVA storage that may be readily satisfied by a modest 16,384 kilobit (2,048x8 bits) RAM device.

Alternating Monitors

Although I have thus far I have described my invention in terms of a primary display and a secondary display (or several secondary displays), I also anticipate my invention to include alternation of monitors. What this means is that two or more monitors may be used wherein the screen image on the most recently activated monitor becomes the predecessory monitor upon command initiated by the user. As a result the lowest order predecessory monitor becomes the primary monitor.

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OPERATION WITH TWO MONITORS

User Action	Monitor No. 1	Monitor No. 2
Edit	Primary	View 1
Next	View 1	Primary
Edit	View 1	Primary
Next	Primary	View 1

OPERATION WITH SEVERAL MONITORS

User Action	Monitor No. 1	Monitor No. 2	Monitor No. 3
Edit	Primary	View 1	View 2
Next	View 1	View 2	Primary
Edit	View 1	View 2	Primary
Next	View 2	Primary	View 1
Edit	View 2	Primary	View 1
Next	Primary	View 1	View 2

These charts depict the multi-monitor action. Under User Action, Edit infers the user is presently working on the document. Next infers the User having entered a "screen grab" instruction. Under Monitor No. 1 (2 or 3) Primary means the display is active, e.g. the one being edited. View 1 means the predecessory screen data just preceding the current Primary view. View 2 means the predecessory screen data just preceding the current View 1. Obviously this scheme for multiple displays is extensible to any reasonable number of monitors.

Hardcopy Printout Replication

An external adaptor may be provided which obtains "hardcopy" or equivalent data from the computer's parallel LPT port or serial COM or USB port. In this arrangement, the video display signal which may be provided to the secondary display monitor is specifically limited to that level of information which is ordinarily sent to a printer when a usual SHIFT+PRINT_SCREEN keyboard entry is made. The binary signal provided through the parallel or serial port is conditioned and sent to the DATA input lines of a memory having sufficient capacity to store data for at least one screen of information. Initial occurrence of the screen print signal on the printer output COM or LPT line may be singularly sufficient to trigger storage of the subsequent data. Alternatively, a programmer may create a TSR software routine which can be installed in the computer to enable redirection of immediate principal video display monitor data to the appropriate COM or LPT port through keyboard entry of a unique keystroke combination, such as the Alt_Shift_PScr routine.

OBJECTIVES

An objective of my invention is to sample and store a selected screen of processed video ordinarily coupled with a primary monitor and thereafter continue to display the selected screen sample on a secondary monitor.

Another objective for my invention is to utilize a processed video data flow between a computer and a primary display monitor as a source of data which may be sampled, stored and subsequently retrieved for later display on a secondary monitor.

An outstanding aspect of my invention is to enable multiple monitor display utilization with substantially any

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operating system, including all versions of Windows®, MS-DOS, Unix, Linux, CP/M86, and Mac-OS® running on any personal computer or workstation platform utilizing an accessible processed video signal line (such as VGA) coupled between a video signal processor and a display monitor.

Yet another goal for my invention is to provide a user with a current and previous display of a working document on separate primary and secondary monitors utilizing a stored replication of the processed video signal as ordinarily coupled with the primary monitor to develop the secondary monitor's display.

An extended object for my invention is to allow "display rotation" where the primary display and secondary display alternate back and forth between a first monitor and a second monitor as the user advances through successive screens of the work document.

Another convenience provided by my invention is to enable the storage of several predecessor screens of information any one or more of which may be re-presented on the secondary monitor in response to a user's command.

A fundamental intent for my invention is to adapt an individual frame or screen of processed video data signal flow between a computer and a primary display monitor into a storable data format and subsequently read back the stored data in a replicate processed video signal form suitable for followup display on a secondary display monitor.

Still another objective for my invention is to teach other artisans the essence of a translative video adaptor TVA which may be implemented in an unobtrusive form to intercept or grab frames of processed video signal flow between a computer and a primary display monitor whereupon the grabbed video signal frame data is temporarily stored and subsequently read-out to provide a true display of the grabbed video signal information on a secondary monitor subsequent to change of the primary display monitor data presentation.

A key object for my invention is to provide at least dual monitor display of a computer's processed video, whereby the first monitor's display is current and the second monitor's display is replicate of a screen display precedingly presented on the first monitor.

An economic object of my invention is to enhance computer usability and convenience with several monitors wherein one displays an immediate video screen and another displays at least one predecessor screen of data while the overall system requires a very low threshold of computer operator skill in order to obtain a most economic level of benefit from the enhancement.

A most versatile object for my invention is to provide multi-monitor display of current and predecessor screen data with any class of operating system running any version of applications software, whether Windows® capable or not, as installed in nearly any computer platform extending from the original 8086/8088 microprocessor through the best Pentium-III or later-art microprocessor based motherboard hardware and including "mainframe" systems and other small computers such as the 68000 or 603e microprocessor based Apple and Macintosh® systems.

A functional object for my invention is to be couplable into the processed video signal line (cable connection) usually extensible between a computer's video processor output and the computer's video display monitor input and furthermore providing for the necessary installation with a minimum of technical skill on the part of the installer.

DESCRIPTION OF DRAWINGS

My invention is depicted on 14 sheets of drawings showing 17 figures.

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FIG. 1—Primary and secondary monitors display same video data.

FIG. 2—Primary monitor displays new video data while secondary monitor continues to display antecedent (predecessory) data.

FIG. 3—Primary monitor display advances to show other new video data while secondary monitor continues to display predecessor data.

FIG. 4—Prior art arrangement of a computer, monitor and printer.

FIG. 5—Computer used with a TVA coupled with the computer's processed video output and including an auxiliary secondary display selection key-switch.

FIG. 6—Operation of TVA from computer's usual printer port.

FIG. 7—Computer used with a TSR program and providing TVA control of multiple secondary displays selected by control signal delivered on USB or standard serial port.

FIG. 8A—Write first then Read sequence for system using a secondary and tertiary monitors.

FIG. 8B—Alternate Write/Read sequence relative with that of FIG. 8A.

FIG. 9—Hookup showing addition of quaternary and quinary monitors.

FIG. 10—Write before Read sequence for system using four antecedent levels of supplementary monitors.

FIG. 11—Deriving TVA signals from usual computer VGA display video signal.

FIG. 12—Deriving TVA signals from usual computer serial printer port with software operating in graphics mode.

FIG. 13—Deriving TVA signals from usual computer parallel printer port with software operating in ASCII character mode or graphics mode.

FIG. 14—Control signal paths for parallel printer port derived TVA data.

FIG. 15—Alternate bank switching of video memory to provide separate and alternate write and read time intervals.

FIG. 16—TVA included on PC expansion card and including a jumper connection to mate with output of a video adapter card.

FIG. 17—TVA provided as a separate freestanding device providing universal installation for any of a variety of computer configurations.

DESCRIPTION OF INVENTION

A computer 10 (including at least usual CPU, RAM, ROM, keyboard and mass storage elements) is shown in FIG. 1. A first screen of processed video data signal which ordinarily drives a separate display monitor appears on line 12 and couples with the input of my TVA 20-1. The TVA provides two outputs, line 22 which is substantially content-equivalent to the data on line 12 feeding a primary monitor 30 displays the computer's immediate video signal data, while video signal data on line 24 is processed through the TVA.

In this particular depiction, the video data on line 24 is similar to that on line 22 and therefore the displayed data ABC on the secondary monitor 32 is essentially a replica of the displayed data ABC on the primary monitor 30. The FIG. 1 depiction shall underscore a key aspect of my invention, that being the TVA 20-1 is functionally distinct from the computer 10 and the only video signal received by the TVA is the processed video data signal delivered by the computer

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on line 12. Furthermore, the processed video data signal delivered from the computer is a display-ready video signal which has been processed through a video adapter or “graphics accelerator” card.

In FIG. 2 the TVA 20-1 receives a second screen of the processed video data signal originating from the computer on line 12. The realtime video data is immediately passed to the primary monitor 36 where it is displayed as the second screen data DEF while the TVA serves to store a first screen sample of the processed video data signal as a predecessor data representative of the original or first screen of information. The stored predecessor data is subsequently read-out and replicated as the first screen of the processed video data signal. Subsequently coupled 24 with the secondary monitor 32 it continues to display the first screen of stored video data ABC and the display may continue to be viewable by a user.

The TVA of FIG. 3 continues to receive the processed video signal data on line 12 as a succession of video screen advances from the computer 10 where the most current information, for example a third screen data XYZ, is fed to and displayed on the primary monitor while the earlier viewed second screen data DEF is stored in the TVA and used to provide antecedent (second) screen of processed video data signal for the secondary monitor 32.

A PRIOR ART representation of a contemporary PC (personal computer) or office computer is shown in FIG. 4 to include a computer 10, a processed video signal line 12, data entry keyboard 14, primary display monitor 30, printer signal line and printer 40. Together these devices provide a versatile, highly utilitarian arrangement which can store data, create and edit documents, maintain bookkeeping records, enable game playing, send and receive fax data, provide internet connection and a variety of other everyday purposes. As shown in this hookup, only one display monitor is ordinarily used and it simply displays current information stored in the computer’s video memory.

The representation of FIG. 4 is meant to comprehensively include any of a variety of user interfaced computers. This shall include computers which may be used as workstations in conjunction with a network (not shown) in accord with well known practice.

Generally, two principal categories of “small” computer architecture prevail at the time of this invention. One is a category of computer’s originally developed around the Intel 8086 microprocessor as manufactured by hundreds of makers and collectively known as “IBM-PC” compatible designs. The other less significant category is the Macintosh® or iMac® made solely by Apple Computer. The invention is applicable in a broader sense to any computer system having an external monitor (dumb terminal) in which a display-formatted processed video data signal is submitted from the computer to the monitor.

In FIG. 5 my TVA 20-2 couples via the processed video data signal lines 12 and 22 between the computer and the primary monitor 30 where a fifth screen of data PQR. This primary monitor display typically represents data processed contents and an immediate working document display resulting from a software program running in the computer 10.

Another video output 24 signal line drives a secondary monitor 32 which, instead of displaying the immediate working document display, serves to display a full screen of stored antecedent information shown as a fourth screen of data JKL which a user can employ as a reference or for other purposes relative with the primary screen information. Pre-

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decessory screen data displayed on the secondary monitor 32 is useful for various computer applications. In particular the user entered keyboard 14 actions may be immediately shown on the primary monitor 30 and compared with another document, or an unchanged version of the same document which appears an an antecedent display on the secondary monitor 32. This capability is invaluable for a variety of everyday computer applications, such as while editing a document in a wordprocessor, data file or spreadsheet application. In this hookup depiction, an accessory key-switch 16 is typically made accessible to the keyboard operator and pressing the key-switch initiates a grabbing of the immediate video signal data on line 12 for storage, readout and subsequent predecessor display on the secondary monitor 32. For example, I have found that the key-switch 16 may be included as a “third button” in a mouse and either hooked directly to the TVA 20-2 as shown, or else looped through the computer 10 and coupled with the TVA (not shown).

The computer 10 of FIG. 6 provides a usually printer graphics formatted printer signal on line 18-1 which may couple via line 18-3 with a dot matrix, inkjet or laser printer 40. Keep in mind however, that aside from being graphics formatted the signal on line 18-1 may also provide straight ASCII characters that may be printable, as well as serve various control functions for the printer. Alternatively, the line 18-1 data may be coupled with line 18-2 and provide a printer graphics formatted or ASCII formatted version of processed video data signal input to my TVA device 26. The TVA is configured by design to store and subsequently retrieve the processed video data signal and reconstitute it as a true replication of the SHIFT+PRINT_SCREEN originated primary monitor’s screen view. As a result, a video signal is produced on line 28 representing a full antecedent primary monitor screen display of computer 10 information which is promptly displayed on the secondary monitor 32. It is shown that the primary monitor 30 may have an immediate display EFG, while the secondary monitor 32 may display a predecessor screen CDE of information.

The computer 10 of FIG. 7 provides the video signal 12 to my TVA 50 and subsequently the realtime video signal couples via line 22 with the primary monitor as a display screen KLM In this hookup, a TSR software program 11 is appears loaded into the computer 10. The keyboard 14 subsequently becomes responsive to a unique keystroke entry 15, such as the Alt_Shft_PScr earlier mentioned sequence. It is the purpose for the TSR program to recognize and translate keystroke sequences into FSC (frame selective control) signals which may output through the computer’s serial port on line 19 and couple with the TVA 50. This signal bus is typically a conventional RS232C or Universal Serial Bus USB connection, customarily or at least often denoted as a COM port. As a result, the video frame grab signal developed on line 19 is entirely independent from any signal states on the video line 12.

The TVA serves to grab the desired current screen of data and store it in a memory 54 coupled to the TVA via data bus 52. I show the memory 54 partitioned so as to include three separate memory banks. For this illustration, say the first grabbed signal is currently stored in BANK-0 56-1 and a second grabbed signal is nextly stored in BANK-1 56-2. The TVA may then readout the BANK-0 data to couple 25-1 with a secondary monitor 34-1 to produce a second level of data display IJK and readout the BANK-1 data to couple 25-2 with a tertiary monitor 34-2 to produce a third level of data display JKL, each of which are earlier in time sequence with the immediate screen display KIM shown on the primary

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monitor 30. Subsequently if a third FSC signal occurs on line 19, the data on video line 12 is written into memory BANK-2 56-3 and when the write step is complete, the display data maintained in the latest BANK-2 memory store are converted to readout and supplant the earlier data readout obtained from the memory BANK-0 and coupled with line 25-1. In this manner, the memory banks are effectually rotated so that necessitous readout may occur after write-in is fully completed. This virtual rotation of memory banks serves to improve display cosmetics in that the actual display change does not occur until a full screen of data has been transferred into the pertinent memory bank. This FIG. 7 depiction shows how several secondary display monitors 30,34-1,34-2 may be utilized to provide many simultaneous screens of information which may vary in content.

A preferred sequence of secondary and tertiary monitor display is shown in a chart of FIG. 8A. Three banks of memory are shown (Bank 0, Bank 1, Bank 2) which are written into when a primary display screen of data is selected. I show (by way of this example) the succession of each of the selected primary screens and their subsequent writing into memory as step W1 through W12, representing the antecedent supplementary display screens 1 through 12. Readout is depicted as R1 for the secondary monitor and R2 for the tertiary monitor. In this arrangement, the most recent antecedent display appears on the secondary monitor 34-1, with the tertiary monitor 34-2 display showing the second most recent antecedent display. With TIME at 0 (zero) indicating system startup, the X in Bank 1 and Bank 2 memory positions denotes that no previous readable data is present and secondary or tertiary monitor readout is unavailable. I find it advantageous (in video circuits associated with my TVA) to provide a screen blanking of the secondary and tertiary monitors when no valid video data is available, as represented by the "X".

An alternate, but in essence equivalent, sequence of secondary and tertiary monitor display is shown in FIG. 8B. In this arrangement the first or ODD selected screen of data appears on the secondary monitor (readout R1) while the second or EVEN selected screen of data subsequently appears on the tertiary monitor (readouts R2). This pattern continues, with the continuation of ODD and EVEN selections shifting respectively between the secondary and tertiary monitors.

In FIG. 9 I show a hookup for a quaternary monitor 34-3 and a quinary monitor 34-4 extension to the hookup of FIG. 7. Together with the secondary monitor 34-1 and tertiary monitor 34-2, this arrangement embraces a total of five monitors, including the primary monitor 30. The quaternary and quinary monitors obtain antecedent video data on lines 25-3,25-4 from the TVA 50'. I also shown that the video memory 54' associated with the TVA includes additional memory storage BANK-3 56-4 and BANK-4 56-5 in support of the additional predecessor display monitors.

A preferred WRITE and READ pattern for the four supplementary monitors is shown in a chart of FIG. 10. In this showing, the antecedent displays shift from the lowest order secondary monitor to the highest order quinary monitor as new video data is severally written into the memory banks. In other words, the secondary monitor displays the most recent antecedent to screen of data while the quinary monitor shows the oldest antecedent screen of data. Looking at the chart of FIG. 10, symbols W1 through W20 represent WRITING into memory Banks 0 through 4 of FIG. 9. This further represents the writing of the first twenty of the display frames selected for antecedent display. Symbols R1

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through R4 represent READING from 4 of the 5 memory BANKS 0 through 4 in a successive pattern. The READ pattern preferably satisfies the following arrangement:

- R1=data for SECONDARY monitor 34-1
- R2=data for TERTIARY monitor 34-2
- R3=data for QUATERNARY monitor 34-3
- R4=data for QUINARY monitor 34-4

As a result, the most recent antecedent data appears on the SECONDARY display with prior antecedent display data shifting from the SECONDARY display to the TERTIARY, QUATERNARY and then QUINARY displays as additional antecedent display data are selected from the PRIMARY display and subsequently displayed on the SECONDARY display. In effect, the SECONDARY display presents the most recent predecessor data screen while the QUINARY display presents the least recent or "earliest" of the four monitor presentations of predecessor data.

Looking at FIG. 11 shows a coupling 62-1 between a VGA (video graphics array) processed video data signal source connection 60 originating from the computer with a VGA video output connection 64 that couples to the primary display monitor 30.

VGA CONNECTOR PIN TERMINALS
15-pin High Density D-Shell Connector

Pin No.	Function
1	RED Video
2	GREEN Video
3	BLUE Video
4	Reserved
5	Digital Ground
6	RED Return
7	GREEN Return
8	BLUE Return
9	Plug
10	Digital Ground
11	Reserved
12	Reserved
13	Horiz. Synch.
14	Vertical Synch.
15	Reserved.

A portion of the coupled VGA processed video data signal is branched over 62-2 to a RGB Video Processor 70 which includes video amplifiers delivering a signal on lines 72 typically to a 3-channel RGB A/D Converter 74. In a usual configuration the A/D converter may deliver 3 separate 8-bit outputs, one each for RED 76R, GREEN 76G and BLUE 76B video signals. Hence, the analog VGA signal on line 62-2 is converted into a 3 channel, 8-bit binary signal on the lines 76 which couple to the DATA input of a video memory 80. The data residing on lines 76 may be written-into the video memory 80 in response to a frame grabber control logic function 66, representatively initiated say by a push-button switch 67 or the like. This develops a "frame grabber" signal delivered on line 104 that is subsequently processed through the memory control logic 96. Realize that this analog to digital conversion and data storage scheme is presented as purely representative and that a knowledgeable engineer might substantially alter the technical detail, while still adhering to the spirit of my invention.

The VGA input from the computer also provides horizontal and vertical synchronization signals on lines 92-1, 92-2 coupled with a synchronization processor 90. Synchronization signals on lines 94-1,94-2 couple with an MCL (memory control logic) 96 which serves to coordinate the

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signals **68,106** for enabling the A/D converter and the D/A converter. Additional signals from the MCL provide RD read and WR write control for the video memory **80** as well as control signals **98** for a memory address logic **100**. The memory address logic delivers address data on line **102** which serves the usual memory address function for the video memory **80**. The RED/GREEN/BLUE data signals, appearing on the output lines **82R, 82G** and **82B**, delivered from the video memory couple with a 3-channel RGB D/A Converter **110** which converts the memory stored binary data into analog video signals on lines **112**. The analog video signals couple through a RGB Video Driver **12-0** producing a VGA level signal on line **122** that couples with a connector set **140,142** providing a Secondary VGA Video Output on inter-connective line **144** for feeding a secondary video monitor **36**. A key-switch, mouse-button or the like including the frame grabber control logic **66** may provide a control signal on line **104** which enables the MCL to functionally grab the current frame of processed video data signal content as displayed on the primary video monitor.

Find also that the processor **90** delivers two display scanning synchronization signals VD,HD on lines **132** to a SYNCH DRIVER **130**. The driver delivers the vertical and horizontal drive signals VE,HE on lines **134** to the scanning circuits of the secondary video monitor **36** via inter-connections **140,142,144**.

Connection with the computer **100** through the usual serial printer port **150** (typically COM-1) is shown in FIG. **12** whereby the serial port data couples **152** with an UART (universal asynchronous receiver transmitter) **154**, such as an industry type 8250 or 16550A, the customary purpose for which is to convert the serial RS232C format data flow on the serial port into 8-bit parallel data on line **156**. A clock **160** produces a necessary signal on line **162** which supports the UART.

RS232C SERIAL PORT-COM1, COM2 (COM3, COM4) 25-pin or 9-pin Male D-shell Connector			
25-pin	9-pin	Function	Mnemonic
2	3	Transmit Data	TXD
3	2	Receive Data	RXD
4	7	Request to Send	RTS
5	8	Clear to Send	CTS
6	6	Data Set Ready	DSR
7	5	Signal Ground	GND
8	1	Carrier Detect	CD
20	4	Data Term. Ready	DTR
22	9	Ring Indicator	RI

Other control signals develop on a bi-directional data line **158** which flows between the UART and the data synchronization and R/W control logic **190-1** to maintain the necessary synchronization of data flow and system handshaking. The UART output line **156** couples with a write processor **170** which generally controls flow of data on line **172** to the DATA input of a video memory **180**. Control includes enabling data flow by an enable signal on line **192**.

The video memory **180** is engineered to have sufficient capacity to contain the bytes of data which may comprise one full page of typical printer data, as provided from the serial port connection **150**. The write data and read data control of the memory is effected by signals on lines **184,186** as derived from the R/W control logic **190-1**. A signal on line **194** serves as a reset signal for a memory address control **196** that develops memory address data on line **198**. The memory address control, which includes a binary counter, is

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clocked by a signal available on line **164**. The video memory **180** read data output **182** couples with a read processor **200** which, among other tasks, control flow of read data through response to an enable signal on line **193**. The output **202** of the read processor **200** couples with a character generator **204** including a font memory **206** coupled with the character generator via data bus **208**. The output of the character generator on line **209** is a video data signal which inputs with a video processor **210** that includes scan synchronization, blanking and other well-known video processing functions to deliver a video signal on line **214** that may drive the secondary video monitor **32** and produce a near-replication of the selected original primary display presentation.

As depicted herein, the serial printer output signal may be initiated by a conventional SHIFT+PRINT_SCREEN instruction, whereupon a monochrome page of ANSI data may flow forth from the serial port. This would be a representative hookup whereby for an 80-column (or 80 character), 25-line screen (such as may be delivered under MS-DOS) the screen page would include 2,000 bytes (80x 25) of ANSI character screen data locations or in other words, the video RAM **180** requires a 2 KBx8 memory (2,048 bytes, 8-bits wide) in this application. Using this ANSI character format, a standard black and white MDA monitor or even an old CGA (color graphics adapter) monitor might be economically utilized as the secondary display monitor.

MDA, CGA and EGA MONITOR CONNECTIONS 9-pin Female D-shell Connector on Adapter			
Pin	MDA Function	CGA Function	EGA Function
1	Ground	Ground	Ground
2	Ground	Ground	RED Intensity
3	Not Used	RED Video	RED Video
4	Not Used	GREEN Video	GREEN Video
5	Not Used	BLUE Video	BLUE Video
6	Intensity	Intensity	GREEN Intensity ¹
7	MONO Video	Video Reserved	BLUE Intensity ²
8	Horiz. Drive	Horiz. Drive	Horiz. Sync.
9	Vert. Drive	Vert. Drive	Vert. Sync.

EGA Notes:
¹) Monochrome Intensity
²) Monochrome Video

If the printer data obtained from the serial port is memory mapped and in graphics format, it then becomes similar to ordinary computer video data in content and a substantially larger video memory becomes necessary depending upon the dot resolution of the usual printer data and the number of colors to be handled. This requires little elaboration since memory and video data processing needs for this sort of memory mapped printer application are obvious to a suitably skilled engineer or other practicing artisan.

A computer's parallel printer port is accessed **222-1** in FIG. **13** to deliver an 8-bit parallel data signal on line **224-1** to a data receiver **220** and therefrom via line **226** to a data input of a video page RAM **230**. The parallel port also provides interflow of three other important signals:

A negative going STROBE signal coupled through a receiver **232** serves to signal the TVA that the data line states are valid and stable and therefore writeable into memory. In effect the strobe signal conditionally determines the write signal on line **246**.

A negative going pulse on the ACKN (acknowledge) line **244** is delivered from the write controller **240** on line

242 to indicate that the previous data byte has been received and written into memory and now the next data byte may be sent. In effect the ACKN pulse is a feedback which in part determines the rate of data transfer between the computer and the TVA.

A negative pulse on the INIT (initialize) line delivers a signal through a buffer 234 to the write controller that essentially flags that a new screen (or page) of data is following the pulse.

The write data controller 250 also accepts a signal on line 248 from the write controller 240. The write data controller is responsible for developing the write address location for the video page memory, delivering a write address signal on line 252 as an input to a WRITE/READ address diplexer 260. The write data controller also delivers a signal on line 254 that serves to switch the diplexer between the write and the read address inputs. When in the write mode, the write address data is transferred to line 262 where it serves to various address memory locations in the video page memory 230. Alternatively, when no valid write data is present, the diplexer 260 switches to the read mode. A video display controller 270, which might utilize an industry type 6845 CRTC (cathode ray tube controller) or video controller integrated circuit, develops the read address data on line 272. A timing signal on line 274 serves to align the timing of a character generator 280 and horizontal and vertical scanning synchronization signals appear on lines 276,278 that couple with the video signal generator 290. Read data 232 from the memory 230 couples with the character generator 280 which, in combination with a character font memory 282 intercoupled therewith serves to deliver character data on line 286 that feeds into the video signal generator 290. The combined video data suitable for monitor application appears on line 292, therefrom supplying the secondary display monitor 32 with screen data. The video signal generator can serve to determine the format of the output video signal, thereby the secondary display monitor may be of any type compatible with the video signal. CGA, EGA, VGA, MDA and SVGA are a few of the types of video signal formats which this video signal generator can be engineered to accommodate.

The parallel port connection 222-2 of FIG. 14 which is comparable to connection 222-1 of the earlier figure shows coupling of an 8-bit data bus 242-2 to the input of a data receiver 300, including 8 separate 1-bit receivers.

IBM-PC PARALLEL PORT CONNECTOR ASSIGNMENTS	
25-pin Female D-shell	
Pin	Function
1	Strobe
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	Acknowledge
11	Busy
12	Out of Paper
13	Select
14	Auto Feed
15	Error
16	Initialize
17	Select Input

-continued

IBM-PC PARALLEL PORT CONNECTOR ASSIGNMENTS	
25-pin Female D-shell	
Pin	Function
18	Ground
19	Ground
20	Ground
21	Ground
22	Ground
23	Ground
24	Ground
25	Ground

The received data appears on line 302 and couples with the write processor 170 as earlier said for FIG. 12. Necessary parallel port STROBE and INIT input signals and ACKN output signal data is also coupled between the connection 222-2 and the data synchronization and R/W control logic 190-2 via respective lines 302-1,302-3 and 302-2. Operation of the control logic 190-2 is similar to that taught for FIG. 12. It is a principal intent of my FIG. 14 teaching to show parallel port interface connection with the circuit of FIG. 12, which therein was taught having a serial port input.

A multibank video memory 310 appears in FIG. 15 which complements the earlier circuit of FIG. 12. The intent of this additional memory capacity, shown to include BANK-0 312-1 and BANK-1 312-2 is to enable the writing of new data to one memory bank concurrent with the other memory bank being read out. Since data transfer between the computer and the TVA of FIG. 12 is rather slow (due to a RS232C port's well known limitations on baud rates, etc.) this technique serves to largely overcome the typical slow writing of a screenful of information on the secondary display monitor. Instead instantaneous display of the filled memory bank occurs and less annoying performance ensues. In operation, a bank selector 320 obtains a synchronization signal from the control logic on line 187 and delivers a signal on line 322 which selects between BANK-0 and BANK-1 of the memory 310. More importantly I discover it beneficial that the onset of read-out of a memory bank being written into is delayed until data write-in is complete. As a result the data on line 314 coupled with the read processor 200 corresponds with the selected bank.

WRITE BANK	READ BANK
BANK-0	BANK-1
BANK-1	BANK-0

A manually operable switch 324 may also be utilized to initiate changeover selection of the memory banks.

One embodiment of my TVA is preferably implemented as a plug-in printed circuit card 330 as depicted in FIG. 16 which may readily plug into an edge connector 332-1 ordinarily included in the computers I/O expansion bus or data bus extension 334. It is well known practice to use the expansion bus 334 for purpose of adding accessory cards and this is no exception. However, I merely utilize the expansion bus connections to obtain DC power and limited data bus access, primarily for video frame selection when using the TSR software. DC power is provided for operation of the TVA circuitry through connection with the following standard IBM-PC bus connections:

EXPANSION CONNECTION	
BUS PIN No.	DELIVERS
B1, B10, B31	GROUND
B3, B29	+5 Volts DC
B5	-5 Volts DC
B7	-12 Volts DC
B9	+12 Volts DC

I provide a unique embodiment for the TVA card in that a connector **336** including a short cable **338** (typically about 25 cm length) captive with and extensive from the TVA circuit card structure **330** mates with a VIDEO OUTput connector **339** ordinarily located on a video adapter card **340** commonly included in the computer. As a result, two DB-15 connectors may be mounted upon the support bracket while the necessary third connector (actually the input to the TVA) is held by the umbilical cord arrangement created by the short cable **338**. The video adapter card **340** itself plugs into an edge connector **332-2** portion of the expansion bus **334**. A primary monitor **340** includes a cable and connector **342** which plugs into a mating connector **346** on the TVA support bracket **344**. This allows coupling of the primary display video data with the primary monitor **340**. A secondary monitor **350** also includes a cable and a connector **352** which mates with a connector **354** on the support bracket **344** and thereby secondary video data (e.g., antecedent video data) flows forth to the secondary monitor.

Another preferred embodiment for my invention is generally depicted in FIG. 17 wherein the TVA is treated as a separate freestanding device **370**. A computer **360** provides the processed video data signal from an internal video adapter/video graphics accelerator circuit usually configured as a plug-in card having a video signal port connection. The port connection is coupled via a connector **336-2** and cable **338-2** with an input into the TVA **370**. Ordinarily the processed video data signal couples directly through the TVA via a signal line **372**. The primary monitor **340** includes a connector that couples with the signal line **372** and includes a cable **348** for immediately routing the processed video data signal to the monitor **340** for display DEF.

The signal line **372** also couples with an input to the signal processing portion **374** of the TVA. The configuration of this portion **374** of the TVA is comparable to the circuit elements previously taught relative with FIG. 11. A keybutton actuated switch **362** or the like coupled with the TVA via cable **364** might be used to "grab" a selected frame of video display data, as discussed relative with element **66** of FIG. 11 and elsewhere. A delayed reiterative video signal (aka, a predecessory processed video data signal) presently appears on line **376**, as reconstituted from data stored in a memory bank associated with the TVA processor **374** (see element **80** of FIG. 11 for example). The resulting output on line **376** couples with the secondary monitor **350** via connection **352** and cable **358** to produce a predecessory display ABC on the secondary monitor **350** for user comparative review or reference in conjunction with the current display DEF on the primary monitor **340**. Additionally, I show a power supply such as a "plug in adapter" **380** providing d.c. operating voltage and current via line **382**. This suggests that the TVA may be substantially independent from and merely an accessory to the computer **360**. As a result, the computer **360** is essentially "left-alone", with no requirement for addition of plug-in circuit cards. Realize further that, when the keybutton switch **362** is utilized directly in conjunction with the

TVA **370**, the computer **360** may be operated fully innocent of any additional software needs relative with the TVA.

Although I teach several distinct forms for my invention (as depicted in the accompanying figures and description) this shall not be construed as limiting the scope of my invention to these particular combinations of elements or structural configurations. It is the utter essence of my invention to teach a computer display system in which a secondary monitor may deliver supplementary full screen displays of portions of a document or other data which is being edited or processed on a primary monitor and to give example of apparatus suitable for attaining practical embodiment of the system's method having economical utility for consumer and business oriented applications. It is necessary to realize that the secondary display operating apparatus might take other forms which can be differently engineered to suit a particular application or meet specific operational goals without departing from the fundamental spirit of my invention. It is furthermore necessary to realize that when I give specific operating conditions and signal line hookups for representative operation of portions of the hardware associated with my apparatus or when I recite particular functional conditions or data format, these definitions are guidelines which may serve to example the art which I have developed to others but should not be construed as limiting or regulatory regarding the operative essence of my invention. For example, my reference to a keystroke sequence of Alt_Shft_PScr is not to be construed as limiting, but merely illustrative for purposes of this description. Undoubtedly an enormous variety of keystroke combinations and key entry sequences may be concocted which will work with similar efficacy. A skilled artisan will readily understand that my invention is not narrowly limited to the particular kinds of data sources or display types which I discuss, but the produced operational improvements and user convenience afforded by my invention may be more broadly extended to benefit virtually any type of computer display configuration requiring supplementary displays of previous screens of data on a secondary monitor. Although I show my taught embodiments to be based upon contemporary IBM-PC technology (including clone computers built by Gateway, Dell, Compaq, Hewlett-Packard, etc.), adaptation of my invention's essence to networked workstations and other less popular or older personal computer configurations (including Apple, Macintosh, Acorn, Tandy and others) is considered a mere engineering effort meeting the special or proprietary hardware details of these less popular or obsolete systems. I anticipate that other even substantial variations of my invention's specific form may be implemented which can still serve to satisfy the operational aspects of the functional elements of my invention and such variant choices shall be considered as mere engineering expedients and fully within the scope of my appended claims.

What I claim for my invention is:

1. A multiple monitor video display method for use with a computer to produce a real-time display on a first monitor and a computer user selected predecessory display on a second monitor and comprising steps of:
 - processing computer program data into a ported source of display-ready first processed video data signal;
 - first intercoupling the ported source of first processed video data signal and the first monitor;
 - first displaying the first processed video data signal on the first monitor as the real time display;
 - second intercoupling the ported source of first processed video data signal and a translative video adapter (TVA) comprising further steps of:

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first enabling the computer user to select a first sample of a first screen portion of the first processed video data signal second intercoupled with a TVA input port;

first storing first video data representing the first sample in a first memory;

advancing the computer program data to usually produce a second screen portion of the first processed video data signal for updating the real-time display on the first monitor;

first reading the first stored said first video data from the first memory;

first converting the first read said first video data signal into a first predecessor video signal; and,

second displaying the first predecessor video signal on a second monitor as the first predecessor display.

2. The multiple monitor video display method of claim 1 comprising steps of:

the first enabling the user to select and divert a second sample of a second screen portion of the first processed video data signal intercoupled with the TVA input port;

second storing second video data representing the second sample in a second memory;

advancing the computer program data to usually produce a third screen portion of the first processed video data signal for third display on the first monitor as the updated real time display;

second reading the second stored said second video data;

third converting the second read said second video data into a second predecessor video signal; and,

third displaying the second predecessor video signal on a tertiary monitor as a second order predecessor display.

3. The multiple monitor video display method of claim 2 comprising steps of:

partitioning the first memory into at least two memory bank portions;

said first storing the storable first video data in a first memory bank portion of the first memory;

said second storing the storable second video data in a second memory bank portion of the first memory;

said first reading the first stored said first video data from the first memory bank portion of the first memory; and,

said second reading the second stored said second video data from the second memory bank portion of the first memory.

4. The multiple monitor video display method of claim 3 comprising steps of:

the first enabling the user to select and divert a third sample of a screen portion of the first processed video data signal intercoupled with the TVA input port;

third storing third video data representing the third sample in a third memory bank portion of the first memory; and,

whereby:

concurrent with a first writing of the first video data into the first memory bank, the second memory bank may be said subsequently read and produce display data for the tertiary monitor and the third memory bank may be said subsequently read and produce the display data for the secondary monitor;

concurrent with a second writing of the second video data into the second memory bank, the first memory bank may be said subsequently read and produce the display

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data for the secondary monitor and the third memory bank may continue to be read and produce the display data for the tertiary monitor; and,

concurrent with a third writing of the third video data into the third memory bank, the first memory bank may be said subsequently read and produce the display data for the tertiary monitor and the second memory bank may be said subsequently read and produce the display data for the secondary monitor.

5. The multiple monitor video display method of claim 3 comprising steps of:

the first enabling the user to select and divert a third sample of a third screen portion of the first processed video data signal intercoupled with the TVA input port;

third storing the third video data representing the third sample in a third memory bank portion of the first memory; and,

second enabling the user to select between reading video data stored in the second memory bank and the third memory bank and produce the predecessor video signal for immediate coupling with and rendering on the secondary monitor.

6. The multiple monitor video display method of claim 1 comprising steps of:

interfacing the user with the computer program;

modifying content of the first processed video data signal and the real time display through computer data entries submitted by the user;

maintaining the first predecessor video signal unchanged; and,

presenting the unchanged first predecessor video signal on the secondary monitor as the predecessor display;

whereby the first monitor may be referred to by the user for a primary viewing of the realtime display and the second monitor may be referred to by the user for a secondary viewing of the predecessor display.

7. The antecedent video display method of claim 1 comprising steps of:

installing a keystroke sequence respondent software program in the computer; and,

recognizing a first pattern of unique keystroke sequence entries and therefrom producing a first selection signal to effectuate the selection of at least one of the first sample and the second sample of the first processed video data signal presented to the input port.

8. The multiple monitor video display method of claim 1 comprising steps of:

first entering a pragmatical PRINT_SCREEN command in response to the user's said selection;

accessing the TVA input port through the computer's printer data signal output port usually configured as one of a RS232C serial port COM, a USB port and a parallel port LPT; and,

first reformatting a printer data signal urged by the first entry and delivered through the printer data signal output port into the first predecessor video signal.

9. A multiple screen computer display method for concurrent viewing by a computer operator and including a first monitor displaying current video data and a second monitor presenting a supplementary display of video data, comprising steps of:

operating a computer under software control to produce a first screen data signal comprising a processed video data signal delivered as a display-ready video signal via a video output port;

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intercoupling the display-ready video signal between the video output port, a translative video adapter (TVA) and the first monitor;
 first displaying the first screen data signal as a current video signal on the first monitor;
 selecting a first sample of the first screen data signal;
 first storing data representing the first sample of the first screen data signal in a first memory;
 urging the computer to produce a second screen data signal;
 second displaying the second screen data signal as the current video signal on the first monitor;
 first reading the first stored data from the first memory; and,
 first converting the first read said first stored data into a supplementary display video signal; and,
 first rendering the supplementary display video signal on the second monitor.

10. The multiple screen computer display method of claim 9 comprising steps of:

selecting a second sample of the second screen data signal;
 second storing the second sample of the second screen data signal in the first memory;
 said urging the computer to produce a third screen data signal;
 presently displaying the third screen data as the current video data signal rendering on the first monitor;
 second reading the second stored data from the first memory;
 second converting the second read said second stored data into the supplementary display video signal; and,
 second rendering the supplementary display video signal on the second monitor.

11. The multiple screen computer display method of claim 10 comprising steps of:

partitioning the first memory into at least a first memory bank and a second memory bank;
 first writing the first screen data into the first memory bank portion of the first memory;
 second writing the second screen data into the second memory bank portion of the first memory; and,
 choosing between at least the first screen data stored in the first memory bank and the second screen data stored in the second memory bank for coupling with and presenting the second rendering on the secondary monitor.

12. The multiple screen computer display method of claim 9 comprising steps of:

loading a unique keystroke sequence responsive TSR software program into the computer; and,
 said selecting the first sample of the first screen data signal in immediate response to a recognition of an entry of the unique keystroke sequence denoting a selection command submitted by the computer operator.

13. A multiple screen computer display apparatus, comprising:

a computer means including a first processed video data signal output port;
 a primary monitor means coupled with the first processed video data signal output port and producing an immediate display of the processed video data signal;
 a translative video adapter (TVA) means functionally distinct from data processing and video signal process-

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ing activities of the computer means and coupled with the first processed video signal path ordinarily coupled between the primary monitor means and the computer means, including:

first operative means enabling a user to first select and capture a first page sample from the first processed video data signal path;
 first conversional means for adapting the first page sample of the first processed video data signal into a first storable video data signal;
 first memory means configured for storing the first storable video data signal;
 first retrieval means for iteratively fetching the stored said first storable video data signal;
 second conversional means set for reconstituting the fetched said first storable video data signal into a second processed video data signal; and,
 secondary monitor means coupled with the second conversional means for producing a first predecessor video data display of the iteratively read said second processed video data signal.

14. Multiple screen computer display apparatus of claim 13, further comprising:

said first operative means further enabling a user to second select and capture a second page sample from the processed video data signal path;
 said first conversional means for adapting the second page sample of the first processed video data signal into a second storable video data signal;
 second memory means configured for storing the second storable video data signal;
 second retrieval means for iteratively fetching the second stored said second storable video data signal;
 third conversional means set for reconstituting the fetched said second storable Video data signal into a third processed video data signal; and,
 tertiary monitor means coupled with the third conversional means for producing a second predecessor video data display of the iteratively read said third processed video data signal.

15. Multiple screen computer display apparatus of claim 13, further comprising:

the first operative means of claim 13 comprising a TSR (transient stay resident) software program providing keystroke sequence recognition of a manual keyboard entry to thereby enable the user to said first select and capture the first page sample from the first processed video data signal path.

16. Multiple screen computer display apparatus of claim 13, further comprising:

ancillary selection means including a momentary switch means which may be actuated by the user;
 signal conduit means effective for coupling a selection signal produced by the momentary switch means with a selection signal input port coupling with the TVA; and,
 selection logic means coupled between the selection signal input port and the first operative means enabling a user to first select and capture a first page sample from the processed video data signal path.

17. The translative video adapter means of claim 13 comprising:

a plug-in printed circuit means configured to physically and electrically interface with an expansion slot means portion of the computer means, including:

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a first video connective means for coupling the video signal data between the computer means said first processed video data signal output port and the plug-in printed circuit means;
a second video connective means for coupling the first processed video data signal between the first video connective means and the primary monitor means; and,
a third video connective means for coupling at least the second processed video data signal with the secondary monitor means.

18. The translative video adapter means of claim 13 further comprising:

A/D (analog to digital) converter means having an analog input coupled with at least the first page sample of the first processed video data signal and having a digital output port coupled with a write-data input port of the first memory means;

D/A (digital to analog) converter means having a digital input coupled with a read-data output port of the first memory means and having an analog output port coupled with a driver means and therefrom delivering the reconstituted said second processed video data signal that usually couples with the secondary monitor means; and,

memory control logic means coupled with the A/D converter, the D/A converter and the first memory means to determine synchronization of the first memory means write-data, read-data and address control signal lines.

19. The multiple screen computer display apparatus of claim 13, further comprising:

a data receiver means coupled with a serial port comprising the computer means;

write processor means for conversion of ASCII and binary serial data received through the serial port into a storable binary format data signal coupled with a write-data input of a third memory means;

data synchronization logic means for receiving control line signals from the serial port and determining a

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pattern of synchronization control signals for writing into and reading from the third memory means;

character generator means coupled with the third memory means read-data output port and produce video character signals in response to stored binary format data which are read from the third memory means;

clock means establishing timing and general synchronization of at least the data receiver means, third memory means addressing and a video processor means; and, said video processor means includes a second processed video output which may couple with and render a predecessor display on the secondary monitor means.

20. The multiple screen computer display apparatus of claim 13, further comprising:

a data receiver means coupled with a parallel (printer) port comprising the computer means;

the first memory means including the write-data input port coupled with the data receiver means parallel data output port and a read-data output port which may access data stored in predetermined addressable locations within the memory means;

character generator means including an input coupled with the first memory means said read-data output port;

character font memory means coupled with the character generator means;

write and read control logic means including an input coupled with the parallel (printer) port and an output coupled with the video page memory means; and,

video display generator providing a data transfer synchronization between at least the character generator means, read-out of the first memory means and video display scanning rates for the secondary monitor means, including an input coupled with an output signal port of the character generator and an output producing the second processed video data signal for rendering a predecessor display on the secondary monitor means.

* * * * *

**United States Court of Appeals
for the Federal Circuit**

15-1971

SECURE AXCESS, LLC

Plaintiff – Appellant,

v.

NINTENDO OF AMERICA, INC.,

Defendant – Appellee.

CERTIFICATE OF SERVICE

Being duly sworn according to law, and being over the age of 18,
upon my oath I depose and say that:

On the date indicated below, I electronically filed the foregoing
with the Clerk of the Court for the United States Court of Appeals for
the Federal Circuit by using the appellate CM/ECF system.

I certify that all participants in the case are registered CM/ECF
users and that service will be accomplished by the appellate CM/ECF
system.

Dated: December 2, 2015.

/s/ Timothy J. Billick

Timothy J. Billick

CERTIFICATE OF COMPLIANCE

I hereby certify that this brief complies with the type-volume limitation of Federal Rule of Appellate Procedure 32(a)(7)(B).

This brief contains 5,782 words, excluding the parts of the brief exempted by Federal Rule of Appellate Procedure 32(a)(7)(B)(iii) and Federal Circuit Rule of Appellate Procedure 32(b). The word count was performed by the automated word-counting function of counsel's word processing software.

This brief complies with the typeface requirements of Federal Rules of Appellate Procedure 32(a)(5,6). This brief has been prepared in a proportionally spaced typeface using LibreOffice in a 14 point "Century Schoolbook L" font.

Dated: December 2, 2015.

Respectfully submitted,

/s/ Philip P. Mann

Philip P. Mann